ORDER NO. AD9106157C2

Service Manual

COMPACT disc DIGITAL AUDIO

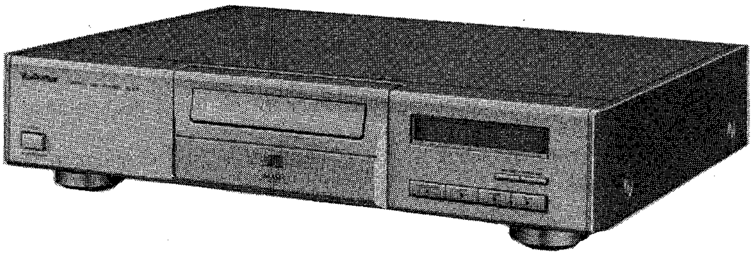
DIGITAL

MASH※
multi-stage noise shaping

Compact Disc Player
SL-E10

Color

(S)...Silver Type



Area

Country Code	Area	Color
(E)	Continental Europe.	(S)
(EB)	Great Britain.	
(EG)	F.R. Germany & Italy.	

System Name	Unit	
SC-E10 (E, EB, EG)	Tuner Amplifier	SA-E10 (E, EB, EG)
	CD Player	SL-E10 (E, EB, EG)
	Cassette Deck	RS-E10 (E, EB, EG)
	Speaker	SB-EX2 (E)

SL-PG100 MECHANISM SERIES (SODD110Z)

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right, stereo)
Frequency response	2−20,000 Hz, ±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	98 dB
S/N ratio	103 dB
Total harmonic distortion	0.003% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH (1 bit)
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ

■ Pickup

Wavelength	780 nm

■ General

Power consumption	18 W
Power supply	AC 50/60 Hz, 230−240 V
Dimensions (W × H × D)	445 × 97 × 330 mm (17-1/2" × 3-13/16" × 13")
Weight	4.2 kg (9.2 lb.)

Note:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

※
- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
- MASH is a trademark of NTT.

Technics

CONTENTS

Page

CONNECTIONS 2

PRECAUTION OF LASER DIODE 3

ACCESSORIES 4

FRONT PANEL CONTROLS AND FUNCTIONS 4, 5

CONCERNING THE REMOTE CONTROL OPERATION 5

HANDLING PRECAUTIONS FOR TRAVERSE DECK 6

DISASSEMBLY INSTRUCTIONS .... 7~13

MEASUREMENTS AND ADJUSTMENTS 14, 15

TERMINAL FUNCTION OF IC'S .... 16~22

INTERNAL CONNECTION OF LCD 22

Page

DIGITAL SERVO SYSTEM 23, 24

TROUBLESHOOTING GUIDE 25, 26

BLOCK DIAGRAM .... 27~29

SCHEMATIC DIAGRAM .... 30~36

PRINTED CIRCUIT BOARDS .... 37~39

WIRING CONNECTION DIAGRAM 40

REPLACEMENT PARTS LIST 41

EXPLODED VIEWS .... 42~44

REPLACEMENT PARTS LIST 45, 46

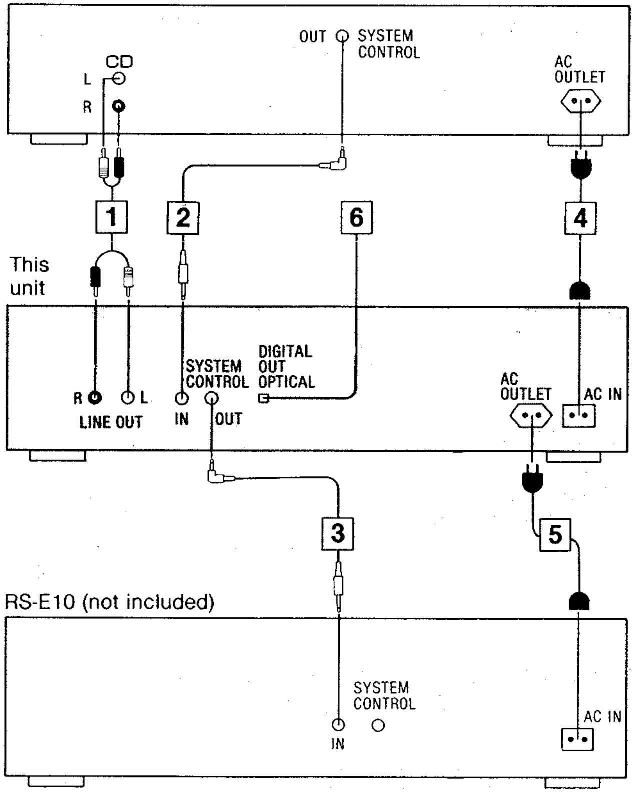
RESISTORS & CAPACITORS 47, 48

PACKING 48

CONNECTIONS

Before making connections, be sure that the power to this unit and all other system components is first turned off.
See the operating instructions of the tuner amplifier (SA-E10) or the cassette deck (RS-E10) for details.

SA-E10 (not included)

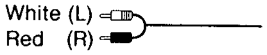


RS-E10 (not included)

Make connections to each component by using the included cords and cables.
Make sure to check in the ☐ each time one connection is finished.

☐ 1 Connect the stereo connection cables included with this unit.

Stereo connection cable



☐ 2 Connect the stereo mini cable for remote-control included with this unit.

☐ 3 Connect the stereo mini cable for remote-control included with RS-E10.

☐ 4 Connect the AC power supply cord included with this unit.

Notes:

- Configuration of the AC outlet and AC power supply cord differs according to area.
- If this unit is not to be connected with SA-E10, the cord is to be connected to the household AC outlet.

For (EB) area.

Cut off and dispose of the plug and replace with a suitable plug.

Household AC outlet

Fit a suitable plug to the AC power supply cord.

☐ 5 Connect the AC power supply cord included with RS-E10.

"UNSWITCHED" outlet:

Power is always available, regardless of power switch. Audio equipment rated up to 80 W can be connected here.

Note:

The configuration of the AC outlet differs according to area.

☐ 6 Connect an optical-fiber cable (not included) to the "DIGITAL OPTICAL IN" terminal of the digital audio tape deck.

PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780nm
Maximum output radiation power from pick up: 100µW/VDE

Laser radiation from the pick up lens is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

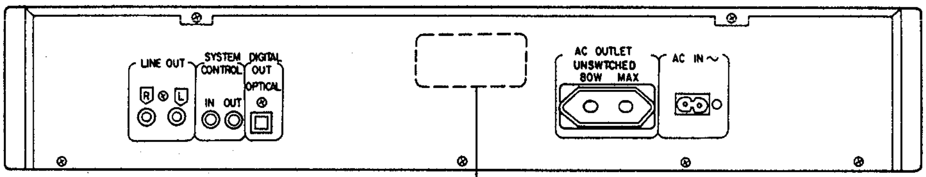
ACHTUNG: Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale strahlungsleistung der lasereinheit: 100µW/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinreit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.



RQLS0051

VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle.
Älä katso säteeseen.

VARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad.
Betrakta ej strålen.
RQLS0051

SQWD7

CLASS 1
LASER PRODUCT
SQWD7

Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

• Use of caution labels

Note: ○ Mark is used, × Mark is not used.

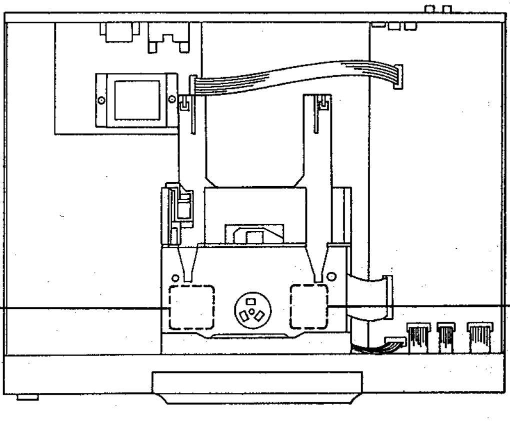
Areas	SQWD7	RQLS0021	RQLS0051
(E)	○	○	○
Others	○	○	×

RQLS0021

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

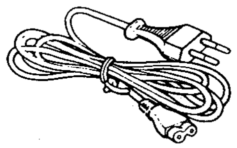
VORSICHT-Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet.
Nicht dem Strahl aussetzen. RQLS0021

DANGER-Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

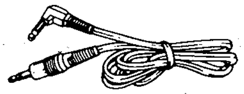


■ ACCESSORIES

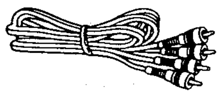
- AC power supply cord...... 1
  SFDAC05E03 (E, EG)
  SJA188 (EB)



- L-type cable............... 1
  (SJP2257T)

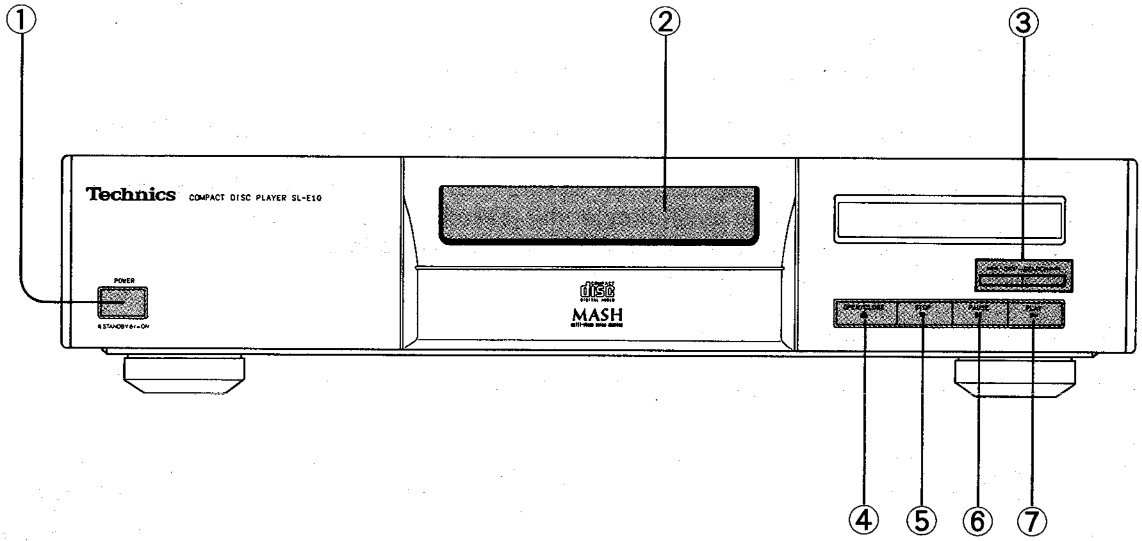


- Stereo connection cable ... 1
  (SJP2129-5)



Note: Configuration of AC power supply cord differs according to area.

■ FRONT PANEL CONTROLS AND FUNCTIONS



Control section

① Power "STANDBY ⏻/ON" switch (POWER ■ STANDBY ⏻/ ▬ ON)

This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the STANDBY ⏻ position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

② Disc holder

③ Skip/search buttons (|◀◀ -SKIP -SEARCH ▶▶|)

Use these buttons to move the pickup forward and backward, or to hear the disc sound as the pickup moves at high speed while playing.

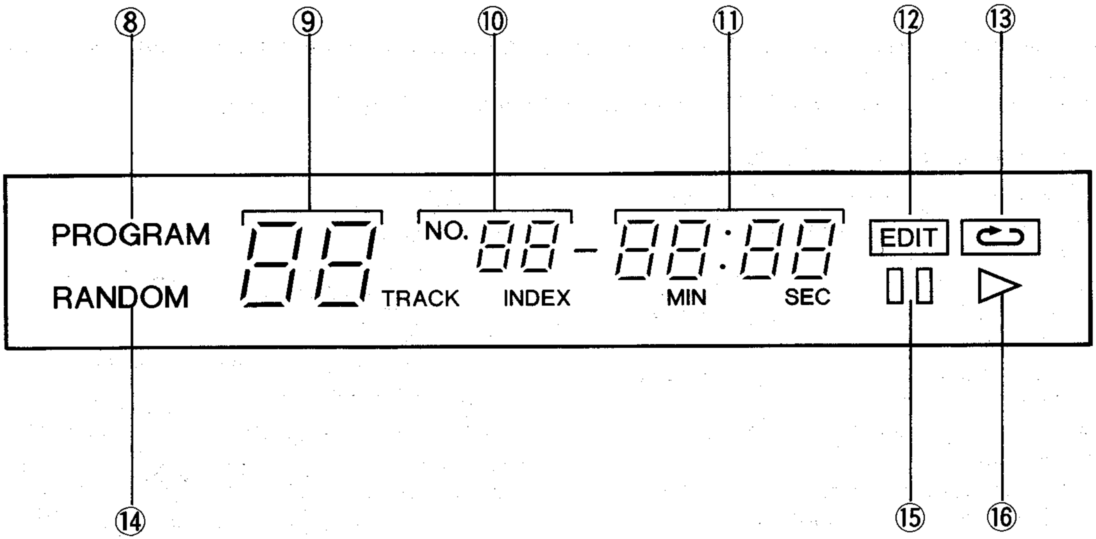
④ Disc holder open/close button (▲ OPEN/CLOSE)

⑤ Stop button (■ STOP)

This button can be used to stop disc play, as well as to cancel the various play modes.

⑥ Pause button (❚❚ PAUSE)

⑦ Play button (▶ PLAY)



Display section

⑧ Program indicator (PROGRAM)
Illuminates when the unit is in the programming or program play mode by using the remote-control transmitter included with SA-E10.

⑨ Track number display (TRACK)

⑩ Index/program number display (INDEX/No.)

⑪ Time display (MIN/SEC)

⑫ Compact disc edit indicator (EDIT)
Illuminates when the edit mode is selected by using the remote-control transmitter included with SA-E10.

⑬ Repeat indicator (↻)
Illuminates when the repeat mode is selected by using the remote-control transmitter included with SA-E10.

⑭ Random play indicator (RANDOM)
Illuminates when the random play mode is selected by using the remote-control transmitter included with SA-E10.

⑮ Pause indicator (II)

⑯ Play indicator (▶)

■ CONCERNING THE REMOTE CONTROL OPERATION

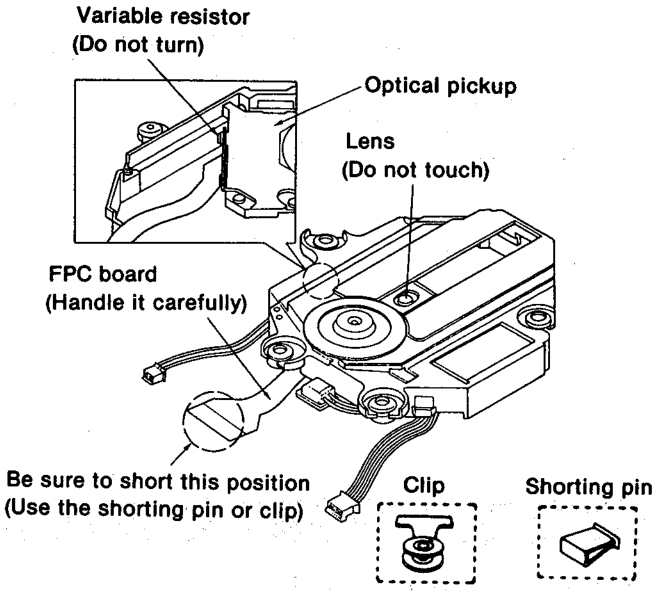
This unit can be controlled by using the remote-control transmitter included with SA-E10 (not included).
See the operating instructions of SA-E10 for detailed information.

HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

• Handling of traverse deck (optical pickup)

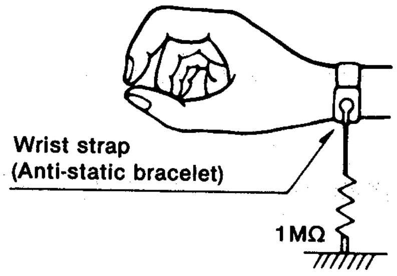
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

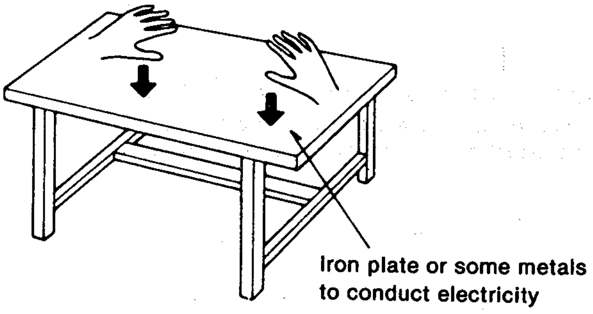

Variable resistor
(Do not turn)
Optical pickup
Lens
(Do not touch)
FPC board
(Handle it carefully)
Be sure to short this position
(Use the shorting pin or clip)
Clip
Shorting pin

• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).


Wrist strap
(Anti-static bracelet)
1MΩ


Iron plate or some metals
to conduct electricity

DISASSEMBLY INSTRUCTIONS

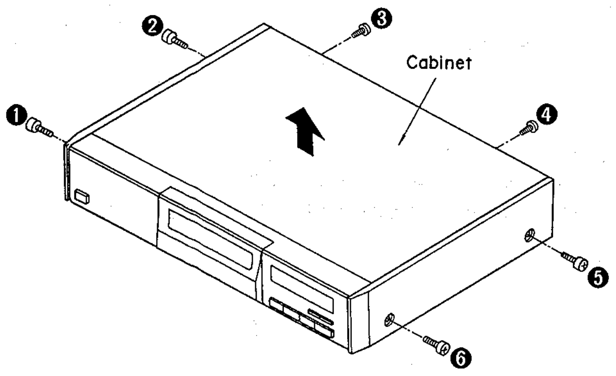
Warning: This product uses a laser diode. Refer to caution statements on page 3.

※This CD player is equipped with FPC boards, so handle them with care during disassembly and reassembly.

Ref. No.
1

Removal of the cabinet

Procedure
1

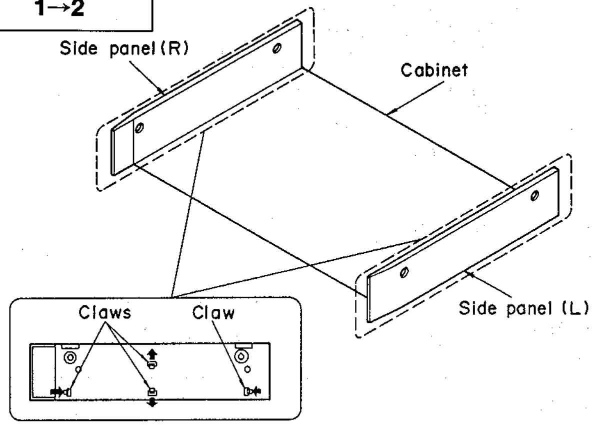

❶
❷
❸
❹
❺
❻
Cabinet

- Remove the 6 screws (❶~❻).

Ref. No.
2

Removal of the Side panels (L)•(R)

Procedure
1→2

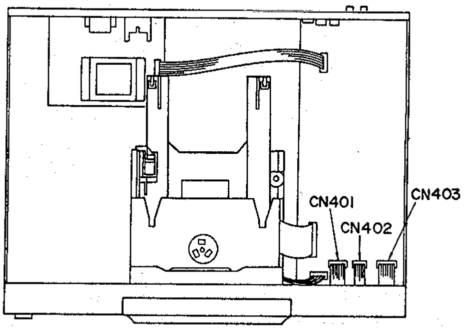

Side panel (R)
Cabinet
Claws
Claw
Side panel (L)

- Release the 8 claws.

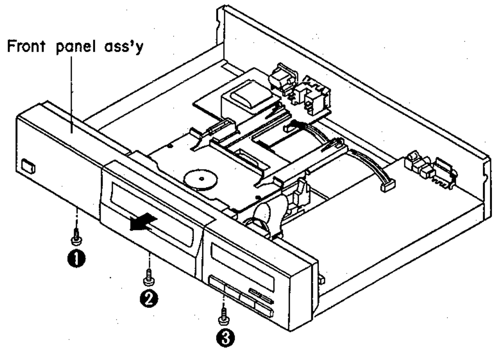
Ref. No.
3

Removal of the front panel ass'y

Procedure
1→3


CN401
CN402
CN403

1. Release the 3 flat cables (CN401, CN402, CN403).

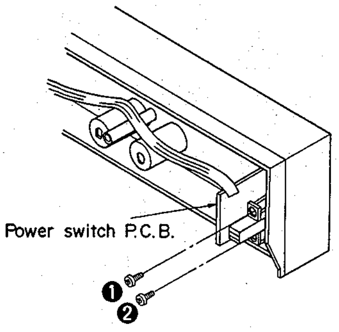

Front panel ass'y
❶
❷
❸

2. Remove the 3 screws (❶~❸).
3. Remove the front panel ass'y in the direction of arrow.

Ref. No.
4

Removal of the power switch P.C.B.

Procedure
1→3→4

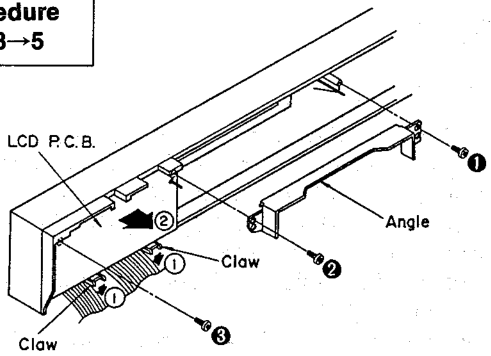

Power switch P.C.B.
❶
❷

- Remove the 2 screws (❶, ❷)

Ref. No.
5

Removal of the LCD P.C.B.

Procedure
1→3→5

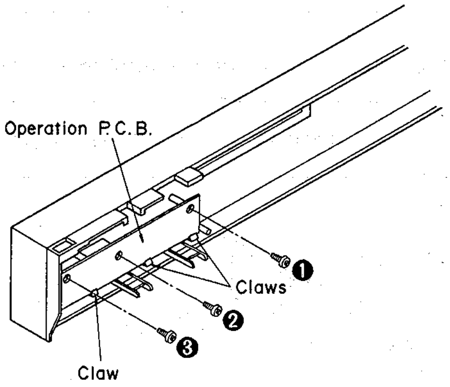

LCD P.C.B.
❶
Angle
②
①
Claw
❷
①
Claw
❸

1. Remove the 3 screws (❶~❸).
2. Remove the angle.
3. Release the 2 claws in the direction of arrow ①, and remove the P.C.B. in the direction of arrow ②.

Ref. No.
6

Removal of the operation P.C.B.

Procedure
1→3→5→6

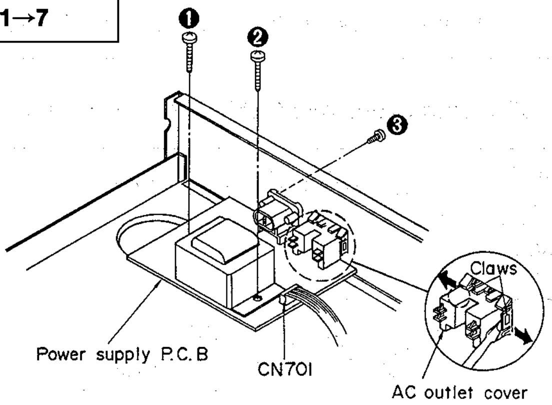

Operation P.C.B.
❶
Claws
❷
❸
Claw

1. Remove the 3 screws (❶~❸).
2. Release the 3 claws.

Ref. No.
7

Removal of the power supply P.C.B.

Procedure
1→7

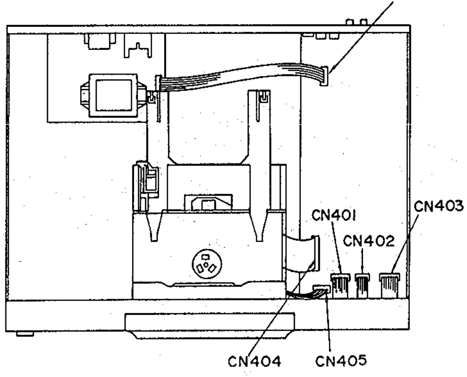

❶
❷
❸
Claws
Power supply P.C.B
CN701
AC outlet cover

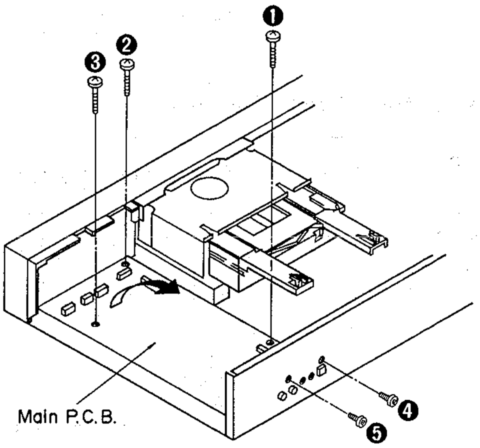
1. Remove the 3 screws (❶~❸).
2. Remove the flat cable (CN701).
3. Release the 2 claws of the AC outlet cover.

Ref. No.
8

Removal of the main P.C.B.

Procedure
1→8


CN1
CN401
CN402
CN403
CN404
CN405


❶
❷
❸
Main P.C.B.
❹
❺

1. Remove the 4 flat cables (CN1, CN401, CN402, CN403).
2. Remove the 2 connectors (CN404, CN405).
3. Remove the 5 screws (❶~❺).
4. Remove the main P.C.B. in the direction of arrow.

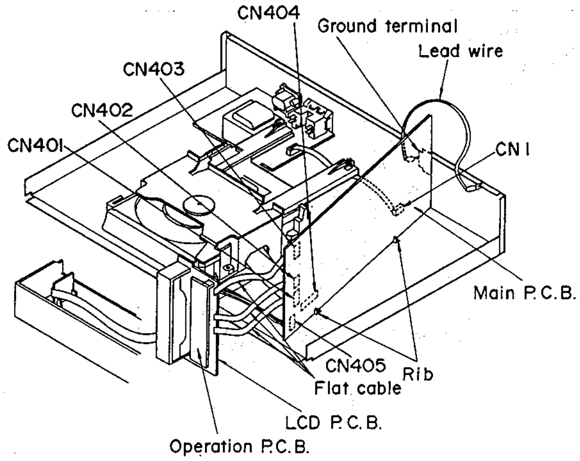
Ref. No.
9

How to check the main P.C.B.

Procedure
1→3→4→5→6
→8→9

- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown right.

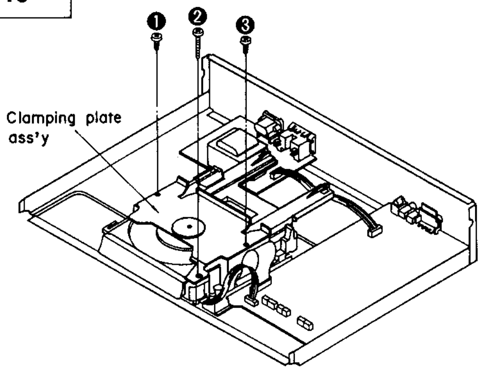
1. Replace the operation P.C.B.to LCD P.C.B.
2. Connect the 3 flat cables (CN401, CN402, CN403) of LCD P.C.B. to main P.C.B.
3. Connect the flat cable (CN1) and connector (CN404, CN405) to main P.C.B.
4. Connect the main P.C.B. ground terminal (Line out terminal) to the chassis with a lead wire.


CN404
Ground terminal
Lead wire
CN403
CN402
CN401
CN1
Main P.C.B.
CN405
Rib
Flat cable
LCD P.C.B.
Operation P.C.B.

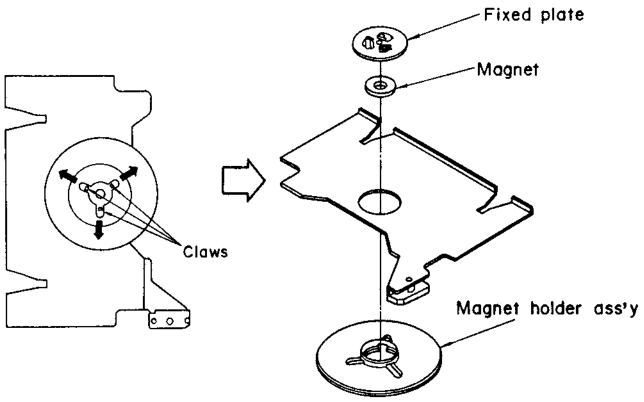
Ref. No. 10

Procedure 1→3→10

Removal of the clamping plate ass'y/fixed plate, magnet and magnet holder ass'y


❶
❷
❸
Clamping plate ass'y

1. Remove the 3 screws (❶~❸).
2. Remove the clamping plate.

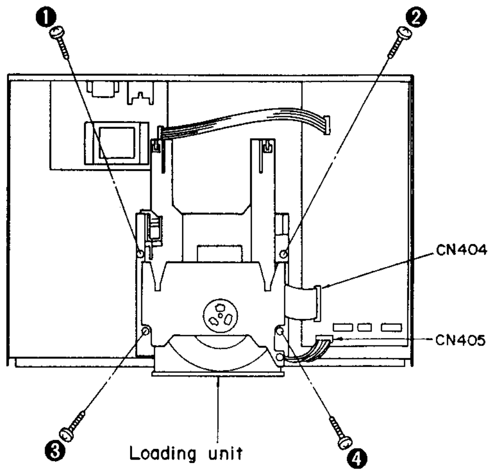

Fixed plate
Magnet
Claws
Magnet holder ass'y

3. Remove the 3 claws.

Ref. No. 11

Procedure 1→3→11

Removal of the loading unit

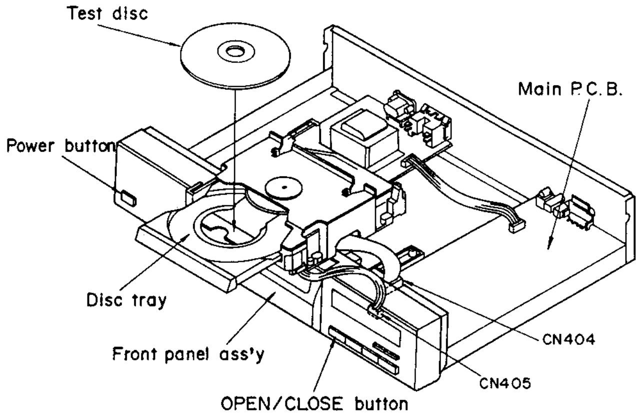

❶
❷
CN404
CN405
❸
Loading unit
❹

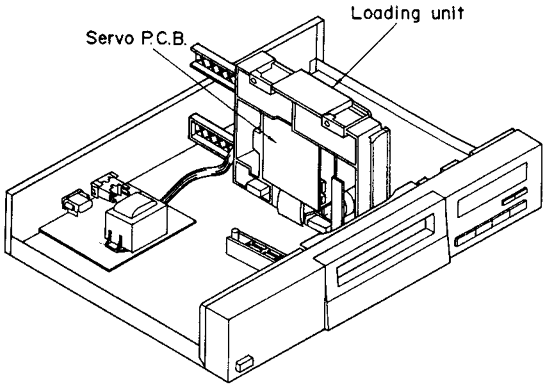
1. Pull out the 2 connectors (CN404, CN405).
2. Remove the 4 screws (❶~❹).

Ref. No. 12

Procedure 1→3→11→12

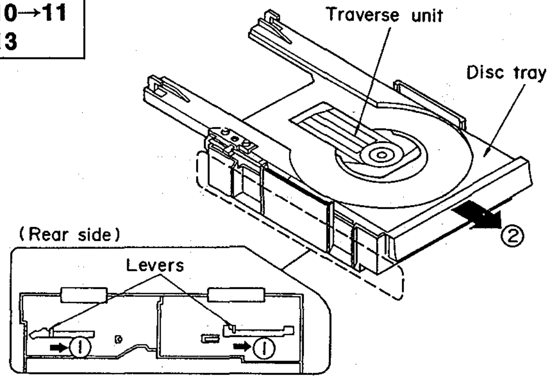
How to check the servo P.C.B.

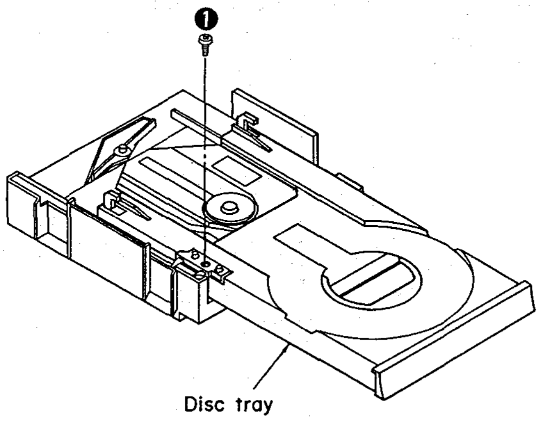

Test disc
Main P.C.B.
Power button
Disc tray
Front panel ass'y
CN404
CN405
OPEN/CLOSE button

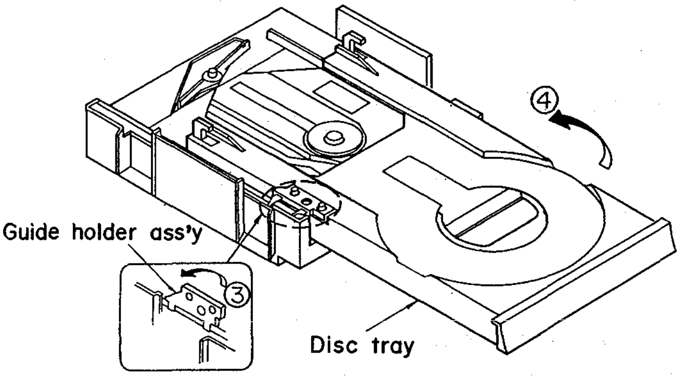

Loading unit
Servo P.C.B.

1. Replace the front panel ass'y.
2. Connect the 2 connectors (CN404, CN405) and 3 flat cables (CN401, CN402, CN403) to main P.C.B.
3. Turn on the power button and press the OPEN/CLOSE button to open the disc tray.
4. Load the test disc and press the OPEN/CLOSE button again to close the disc tray.
5. Place the loading unit sideways as shown above.
6. After placing the unit as shown above, perform check and adjustment of the foil on the servo P.C.B.

Ref. No. 13	Removal of the disc tray
Procedure 1→3→10→11→13	

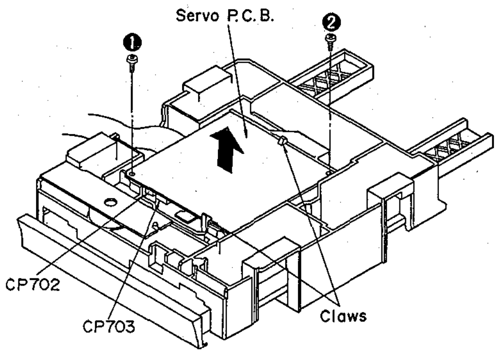

Traverse unit
Disc tray
②
(Rear side)
Levers
①
①




④
Guide holder ass'y
③
Disc tray

1. Push the levers in the direction of arrows ①. The traverse unit will lower and the disc tray will move slightly in the direction of arrow ②.
2. Remove the 1 screws (❶).
3. Remove the guide holder ass'y in the direction of arrow ③.
4. Remove the disc tray in the direction of arrow ④.

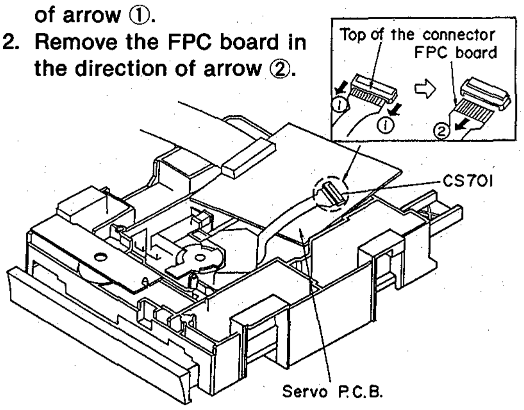
Ref. No. 14	Removal of the servo P.C.B.
Procedure 1→3→11→14	


Servo P.C.B.
❶
❷
CP702
CP703
Claws

1. Remove the 2 screws (❶, ❷).
2. Release the 2 claws.
3. Remove the servo P.C.B. in the direction of arrow.
4. Release the 2 connectors (CP702, CP703).

Note:

1. Push the top of the connector in the direction of arrow ①.
2. Remove the FPC board in the direction of arrow ②.


Top of the connector
FPC board
①
①
②
CS701
Servo P.C.B.

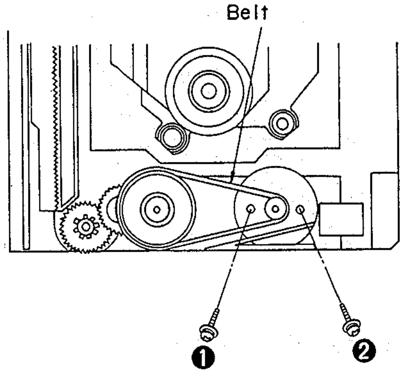
5. Remove the FPC board (CS701).

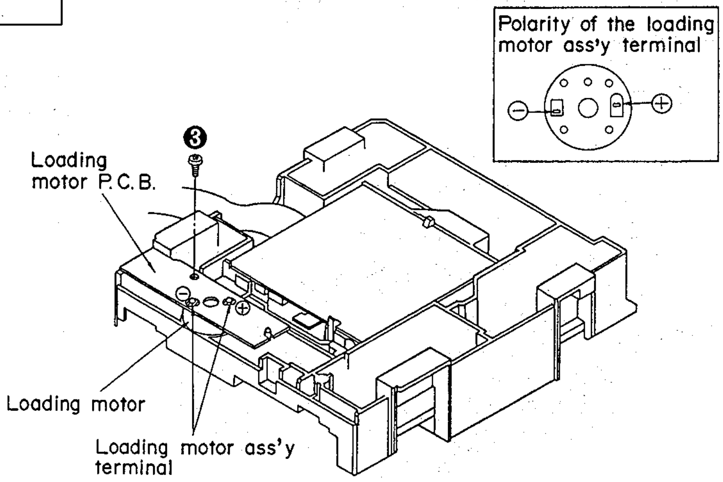
Caution:
Insert a short pin into the traverse unit FPC board. (Refer to "handling precautions for traverse deck" on page 6.)

Ref. No. 15

Removal of the loading motor P.C.B. and loading motor

Procedure
1→3→10→11→13→15



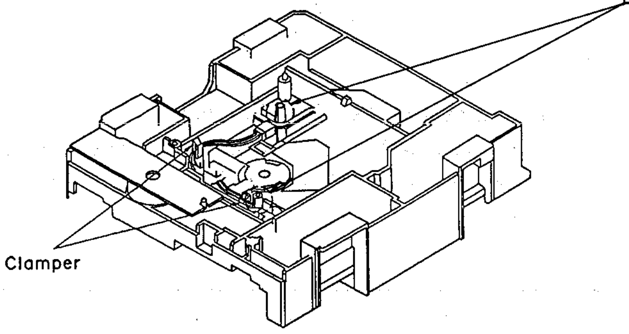

Polarity of the loading motor ass'y terminal
⊖
⊕
❸
Loading motor P.C.B.
Loading motor
Loading motor ass'y terminal

1. Remove the belt.
2. Remove the 2 screws (❶, ❷).
3. Remove the 1 screw (❸).
4. Unsolder the 2 terminals of loading motor.

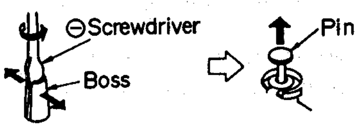
Ref. No. 16

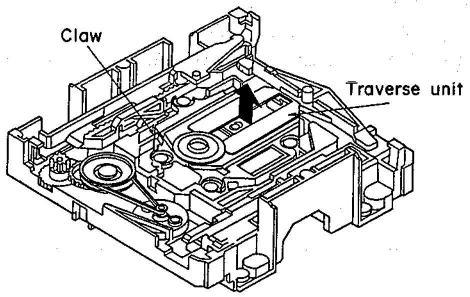
Removal of the traverse unit

Procedure
13→14→16



1. Widen the boss by using a regular screwdriver or similar object.
2. Pull out the pin.


⊖Screwdriver
Boss
Pin

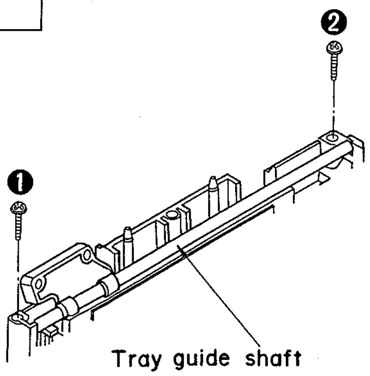

Claw
Traverse unit

1. Remove the lead wire from clamper.
2. Remove the 2 pins.
3. Release the claw and then remove the traverse unit in the direction of arrow.

Ref. No. 17

Removal of the tray guide shaft

Procedure
1→3→10→11→13→17

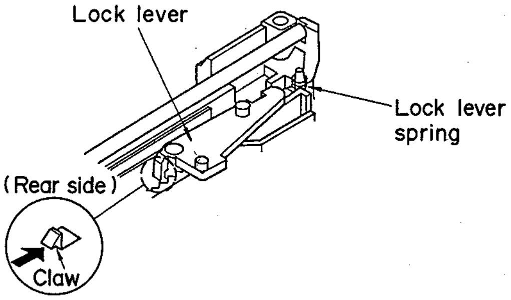

❶
❷
Tray guide shaft

- Remove the 2 screws (❶, ❷).

Ref. No. 18

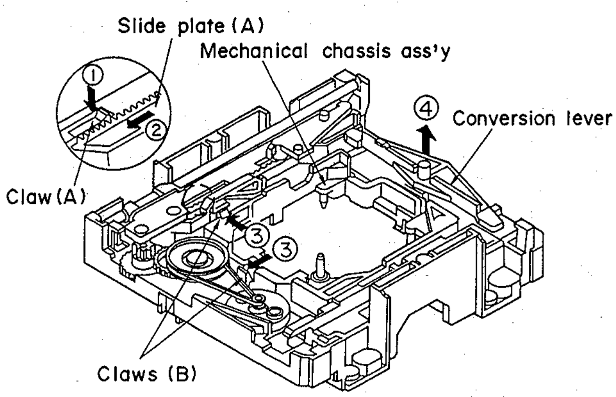
Removal of the lock lever

Procedure
1→3→10→11→13→18


Lock lever
Lock lever spring
(Rear side)
Claw

1. Remove the lock lever spring.
2. Release the claw in the direction of arrow and lift the lock lever.

Ref. No. 19	Removal of the traverse chassis and conversion lever
Procedure 13→14→16 →18→19	


Slide plate (A)
Mechanical chassis ass'y
④
Conversion lever
①
②
Claw (A)
③
③
Claws (B)

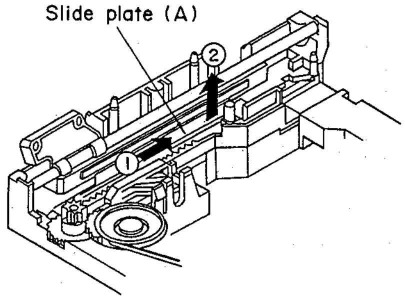
■ **Removal of the mechanical chassis ass'y**

1. Move the slide plate (A) in the direction of arrow ② while pushing the claw (A) in the direction of arrow ①.
2. While pushing the claws (B) in the direction of arrow ③, lift the mechanical chassis ass'y.

■ **Removal of the conversion lever**

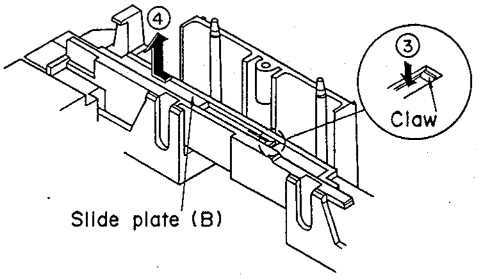
1. Move the side plate (A) in the direction of arrow ② while pushing the claw (A).
2. Lift the conversion lever in the direction of arrow ④.

Ref. No. 20	Removal of the slide plate (A) • (B)
Procedure 13→14→16 →18→19→20	


Slide plate (A)
②
①

■ **Removal of the slide plate (A)**

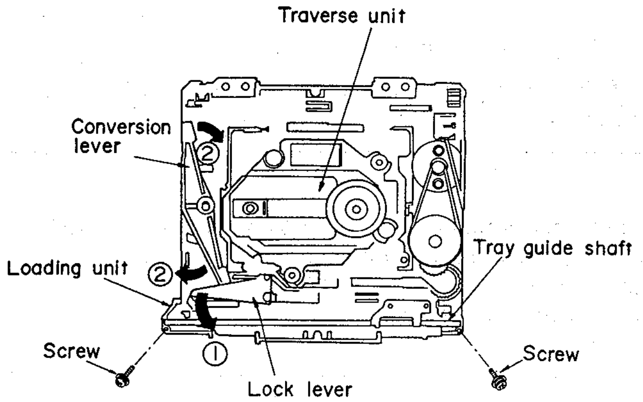
- After moving the slide plate (A) fully in the direction of arrow ①, lift it in the direction of arrow ②.

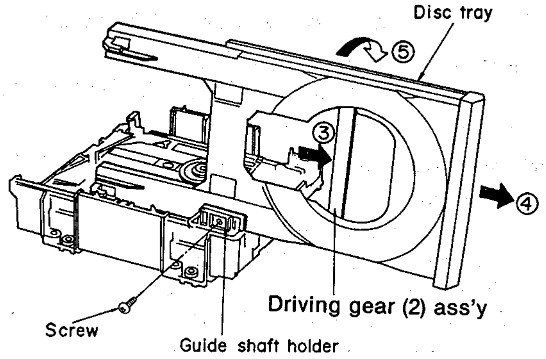

④
③
Claw
Slide plate (B)

■ **Removal of the slide plate (B)**

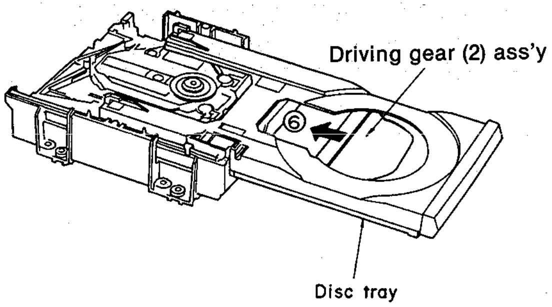
- While pushing the claw in the direction of arrow ③, remove the slide plate (B) in the direction of arrow ④.

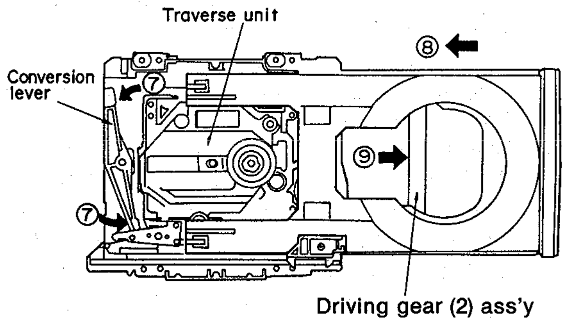
■ Installation of the disc tray


Traverse unit
Conversion lever
②
Loading unit
②
Tray guide shaft
Screw
①
Screw
Lock lever


Disc tray
⑤
③
④
Driving gear (2) ass'y
Screw
Guide shaft holder

1. Move the lock lever in the direction of arrow ①, and then move the conversion lever in the direction of arrow ②.
   (The traverse unit will move upward.)
2. Use the two screws to mount the tray guide shaft to the loading unit.
3. Use the screw to mount the disc tray to the guide shaft holder.
4. Move the driving gear (2) ass'y fully in the direction of arrow ③.
5. Move the disc tray fully in the direction of arrow ④.
6. Tilt the disc tray downward in the direction of arrow ⑤.


Driving gear (2) ass'y
⑥
Disc tray


Traverse unit
⑧
Conversion lever
⑦
⑨
⑦
Driving gear (2) ass'y

7. Move the driving gear (2) ass'y fully in the direction of arrow ⑥.
8. While continuing to support the disc tray with your hand, slide the driving gear (2) ass'y as far as it will go in the direction of arrow ⑥. (Althought it will only slide a small amount, this will allow the loading gear to mesh together with the gear of the disc tray.)
9. Move the conversion lever in the direction of arrow ⑦.
   (The traverse unit will move downward.)
10. Move the disc tray fully in the direction of arrow ⑧. (When doing this, confirm that the driving gear (2) ass'y slides in the direction of arrow ⑨.)

MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 3.

Caution: During adjustment, never connect CH-2 probe's GND to any place for it may short V-Ref. line. (Connect CH-1 probe's GND to specified TP. described in each section.)

Measuring Instruments and Special Tools

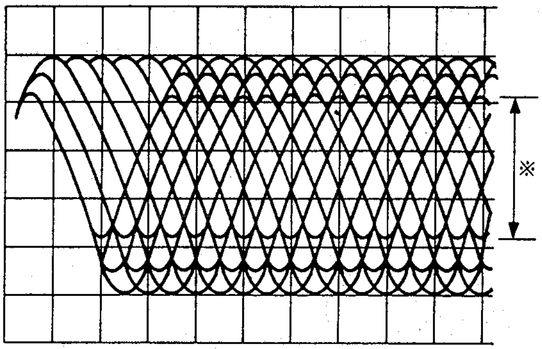
∗ Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

∗ Musical program disc (ordinary)
∗ Extension cable kit (RFKZ0009)
∗ Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1: 1 probe).
∗ Allen wrench (M2.0) (SZZP1101C)
∗ Lock paint (RZZ0L01)

(1) MECHANICAL ADJUSTMENT

- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability if the traverse deck has not been replaced.

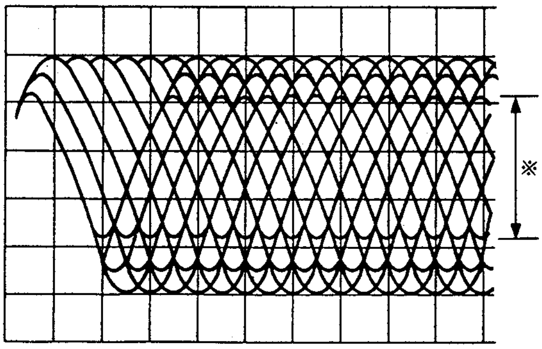
1. Connect the oscilloscope's CH. 1 probe across **TP702** (RF) (+) and **TP703** (V-Ref.) (−) on the servo P.C.B.
   Oscilloscope setting: VOLT..................200mV
   SWEEP.............0.5µs.
   Input coupling.AC
2. Switch the player power **ON**, and play track **19** on the test disc (SZZP1056C).
   (Playing any other track will prevent, the HEX screws from being accessed.)
3. Leave the player in play mode and place the traverse deck as shown under Ref. No. 12 on page 9.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
   (Refer to Fig. 2 on page 15)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



※ Most stretched eye pattern.

(2) BEST EYE (PD BALANCE) ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TP702** (RF) (+) and **TP703** (V-Ref.) (−) on the servo P.C.B.
   Oscilloscope setting: VOLT..................200mV
   SWEEP.............0.5µs.
   Input coupling.AC
2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR701** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 1 on page 15)



※ Most stretched eye pattern.

(3) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

∗ **Checking Skip Search**
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

∗ **Checking Manual Search**
1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

∗ **Checking Playability**
1. Play the 0.7mm black dot and the 0.7mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

• Adjustment points

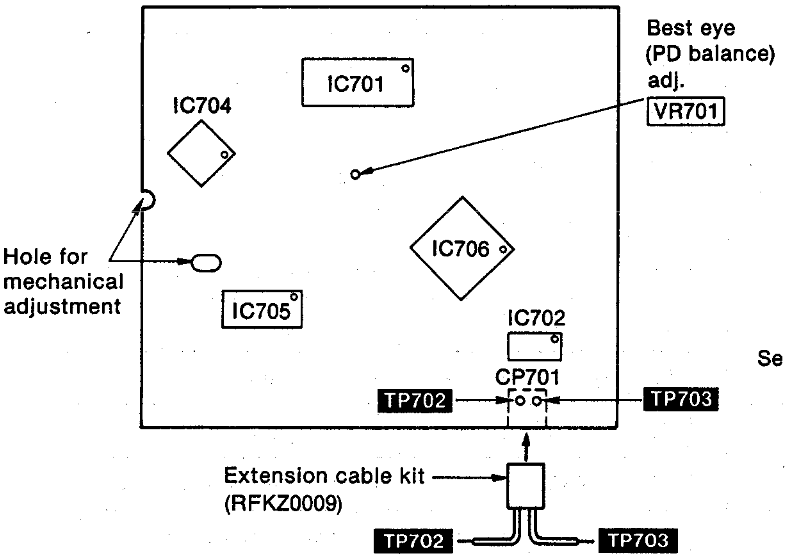

Best eye
(PD balance)
adj.
VR701
IC701
IC704
IC706
Hole for
mechanical
adjustment
IC705
IC702
CP701
TP702
TP703
Extension cable kit
(RFKZ0009)
TP702
TP703

Fig. 1

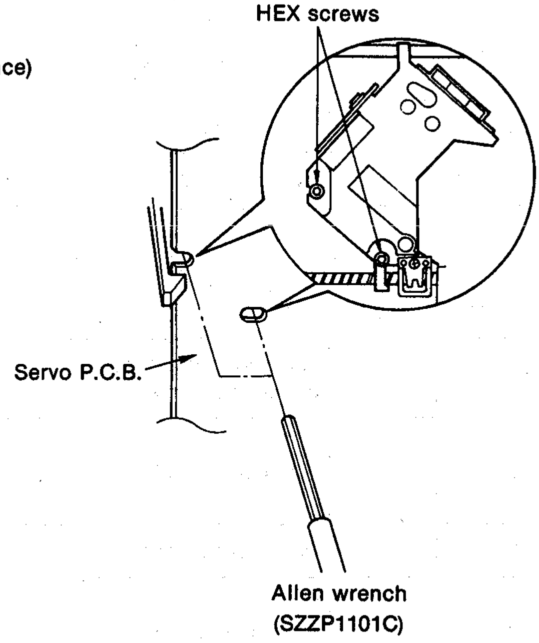
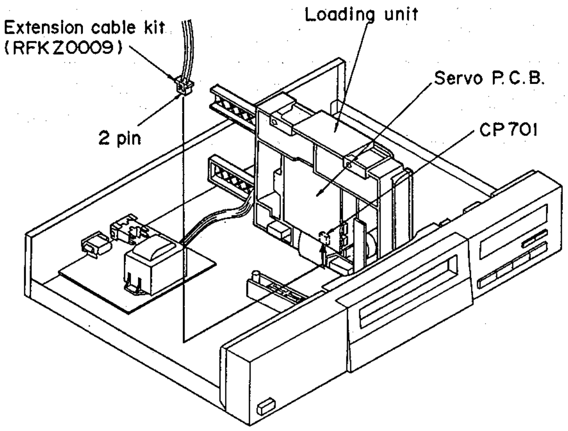

HEX screws
Servo P.C.B.
Allen wrench
(SZZP1101C)

Fig. 2

• How to install the extension cable kit (RFKZ0009)

※ It may be difficult to insert the (2 pin) extension cable while the tray is closed, therefore open the disc tray slightly and insert the (2 pin) extension cable.


Extension cable kit
(RFKZ0009)
Loading unit
Servo P.C.B.
CP701
2 pin

■TERMINAL FUNCTION OF IC'S

• IC402 (MN1554PKL1): System control

Pin No.	Mark	I/O Division	Function
1	MUTE RELAY	O	Muting output (Not used, open)
2	$\overline{\text{PLUNGER}}$	—	(Not used, open)
3	$\overline{\text{SYNC}}$	—	(Not used, open)
4	$\overline{\text{SIRQ}}$	I	(Not used, connected to power supply.)
5	BLKCK	I	Sub-code block clock (f=75 Hz)
6	SQCK	O	Sub-code Q register clock
7	SBO	—	(Not used, open)
8	SUB Q	I	Sub-code Q data
9	RESET	I	Reset terminal
10	CLOSE SW	I	Disc holder "close" det.
11	OPEN SW	I	Disc holder "open" det.
12	REST SW	I	Rest det. terminal
13	NC	—	(Not connected)
14	$\overline{\text{CLOSE}}$	O	Loading motor "close" command signal
15	$\overline{\text{OPEN}}$	O	Loading motor "open" command signal
16 ~ 24	NC	—	(Not connected)
25	V_{DD}	I	Power supply terminal
26 ~ 30	NC	—	(Not connected)
31	FUTA SW	—	(Not used, connected to power supply)
32	MODE	—	(Not used, connected to GND)
33	STAT	I	Status signal (CRC, CUE, CLVS, $\overline{\text{T}}$TSTOP, FCLV, SQOK)
34	$\overline{\text{TLOCK}}$	I	Optical servo condition (tracking) input
35	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
36	SENSE	I	Sense signal
37	$\overline{\text{RECV}}$	I	Data receipt command signal
38	$\overline{\text{SEND}}$	I	Data transmission command signal
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 ~ 44	DATA 0 ~ DATA 3	I	Key scan signal
45 ~ 52	NC	—	(Not connected)
53	OSC 2	I	Clock input terminal (4.2336 MHz)
54	OSC 1		
55	X1	—	(Not used, connected to GND)
56	X0	—	(Not used, open)
57	V_{SS} (GND)	—	GND terminal
58	DMUTE	O	Muting output (H: mute)
59	MDATA	O	Command data signal
60	MCLK	O	Command clock signal
61	$\overline{\text{MLD}}$	O	Command load signal (L: load)
62	TX (D. OUT)	—	(Not used, open)
63	EMPH	O	De-emphasis signal (Not used, open)
64	SERVO RST	O	Reset signal for servo circuit

• IC601 (MB88724BPKQ1): Microcomputer (operation)

Pin No.	Mark	I/O Division	Function
1 ~ 4	P80 ~ P83	—	(Not used, open)
5 ~ 8	P90 ~ P93		
9	$\overline{\text{INH}}$/P20	O	Remote control signal
10 ~ 12	P21 ~ P23	—	(Not used, open)
13	CK OUT/P30	O	System control clock signal
14	D OUT/P31	O	System control data signal
15, 16	P32, P33	—	(Not used, open)
17	CK IN/P00	I	System control clock signal
18	D IN/P01	I	System control data signal
19	ACK/P02	O	Data discrimination signal
20	CLK/P03	O	Data clock signal
21 ~ 24	D0/P10 ~ D3/P13	I	Key scan signal
25	CLK/P40	O	Serial clock signal
26	P41	—	(Not used, connected to GND)
27	RECV/P42	O	External data receive signal
28	SEND/P43	O	External data transfer signal
29	DATA/P50	O	Serial data signal
30	CE/P51	I/O	Chip enable terminal
31	$\overline{\text{RES}}$	I	Reset signal
32	V_{SS}	—	GND terminal
33	X	I	Clock input terminal (4.2336 MHz)
34	EX		
35	SE	I	(Not used, connected to power supply)
36	WD	—	(Not used, connected to GND)
37	XL	O	(Not used, open)
38	EXL	O	(Not used, connected to GND)
39	EDIT/P60	I	(Not used, connected to power supply)
40	OPEN/CLOSE/P61	I	Key return signal
41	R. SKIP/P62		
42	F. SKIP/P63		
43	PLAY/P64		
44	PAUSE/P71		
45	STOP/P72		
46	P73	—	(Not used, open)
47	V_{PP}	I	Power supply of LCD
48 ~ 51	PA0 ~ PA3	—	(Not used, open)
52 ~ 55	PB0 ~ PB3		
56 ~ 59	PC0 ~ PC3		
60 ~ 63	PD1 ~ PD3		
64	V_{CC}	I	Power supply terminal

- **IC701 (AN8800SCE2): Servo amp**

Pin No.	Mark	I/O Division	Function
1	LDG	I	APC loop gain select
2	LDP	I	APC monitor PD polarity select
3	LD	O	Laser power auto control output
4	LPD	I	LD power monitor PD signal
5	GND	—	GND terminal
6	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
7	AMP I	I	RF signal (X30 amp)
8	AMP O	O	
9	RF IN	I	RF AGC signal input
10	RF EQ	—	GND terminal
11	C. AGC	I	AGC detection capacitor input
12	ARF	O	RF signal output
13	C. SBDO	I	Dropout detection capacitor input
14	RF DET	O	RF detection signal ("L": detecting)
15	BDO	O	Dropout detection output
16	V_{CC}	I	Power supply terminal
17	SDO	O	Dropout detection pulse output
18	VAD+	O	Power supply terminal for A/D converter (+)
19	VREF	O	Reference voltage output
20	VAD−	O	Power supply terminal for A/D converter (−)
21	OFTR	O	Off track detection ("H": det.)
22	PLAY	I	Play signal ("H": ON, "L": OFF)
23	WVEL	I	Double velocity ("H": double, "L": single)
24	TES	I	Tracking error shunt ("H": shunt, "L": output)
25	PTO	O	Potentio amp output
26	PTI	I	Potentio amp input
27	PBO	O	Potentio buffer output
28	POT	I	Potentio buffer input
29	CROSS	O	Tracking error zero cross output
30	TE	O	Tracking error signal
31	TE BAL	I	Oscillation det. signal
32	TBAL	I	Tracking balance adj. input
33	VDET	O	Oscillation det. signal ("H": det.)
34	FE	O	Focusing error signal
35	FBL 2	I	Focusing balance 2
36	FBL 1	I	Focusing balance 1
37	V_{CC}	I	Power supply terminal
38	GND	—	GND terminal
39	PDBD	I	Photo detector Bch input with delay
40	PDA	I	Photo detector Ach input without delay
41	PDB	I	Photo detector Ach input with delay
42	PDAD	I	Photo detector Bch input without delay

• IC704 (MN6650): Digital servo processor

Pin No.	Mark	I/O Division	Function
1	TES	O	Tracking error shunt signal ("H": shunt)
2	PLAY	O	Play signal ("H": play)
3	/RFDET	I	RF det. signal ("L": det.)
4	DO	I	Dropout signal ("H": dropout)
5	OFT	I	Off track signal ("H": off track)
6	ARF	I	RF signal input
7	WVEL	O	Double velocity status signal ("H": double)
8	PBO	I	Potensio buffer signal (analog input)
9	TE	I	Tracking error signal (analog input)
10	FE	I	Focus error signal (analog input)
11	VR2	I	Reference voltage for A/D (Low)
12	VR1	I	Reference voltage for A/D (High)
13	LDON	O	Laser power control ("H": ON)
14	V_{SS}	—	GND terminal
15	AV_{SS}	—	GND terminal
16	AV_{DD}	I	Power supply terminal
17	V_{DD}	I	Power supply terminal
18	TRV	O	Traverse servo control output
19	TVD	O	Traverse drive signal output
20	FOD	O	Focus drive signal output
21	TRD	O	Tracking drive signal output

Pin No.	Mark	I/O Division	Function
22	KICK	O	Kick pulse output
23	/TEST	I	Test terminal
24	V_{SS}	—	GND terminal
25	CLVS	I	Spindle servo phase synchro signal ("H": CLV, "L": Rough servo)
26	/TRON	O	Tracking servo ON signal ("L": ON)
27	MDATA	I	Command data signal
28	MCLK	I	Command clock signal
29	MLD	I	Command load signal ("L": LOAD)
30	SENSE	O	Sense signal
31	/FLOCK	O	Optical servo condition (focus) output
32	/TLOCK	O	Optical servo condition (tracking) output
33	/RST	I	Reset signal ("L": reset)
34	XI	I	Clock input (f=16.9344MHz)
35 ~ 38	T0 ~ T3	O	Test terminal (Ordinaly: open)
39 ~ 41	T4 ~ T6	I	Test terminal (Ordinaly: L)
42	VDET	I	Oscillation det. signal ("H": det.)
43	TBAL	O	Tracking balance adj. output
44	TRCRS	I	Track cross signal input

• IC706 (MN6626): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	AVSS	—	GND terminal
2	IREF	I	Reference current input
3	ARF	I	RF signal input
4	DRF	I	DSL bias terminal (Not used, open)
5	DSLF	I/O	DSL loop filter terminal
6	PLLF	I/O	PLL loop filter terminal
7	AVDD	I	Power supply terminal
8	RSEL	I	RF signal polarity setting terminal (Not used, connected to VDD)
9 ~ 16	TBUS7 ~ TBUS0	O	Test terminal
17	FLAG	O	Flag terminal
18	IPFLAG	O	Interpolation flag terminal
19	FCLK	O	Crystal frame clock (Not used, open)
20	BYTCK	O	Byte clock (Not used, open)
21	WDCK	O	Word clock (Not used, open)
22	$\overline{\text{RST}}$	I	Reset terminal
23	TX	O	Digital audio signal
24	LDG	O	Lch deglitch signal (Not used, open)
25	RDG	O	Rch deglitch signal (Not used, open)
26	SRDATA	O	Serial data output (MSB first)
27	SCK	O	Serial bit clock output
28	LRCK	O	L/R discriminating signal
29	XCK	O	Crystal OSC terminal (f=16.9344MHz)
30	PMCK	O	Frequency division clock signal (Not used, open) (f=$\frac{1}{192}$×CK=88.2kHz)
31	CSEL	I	Test terminal (Connected to GND)
32	PSEL		
33	X1	I	Crystal OSC terminal (f=16.9344MHz)
34	X2	O	
35	VSS	—	GND terminal
36	SUBQ	O	Sub-code Q data
37	SQCK	I	Sub-code Q register clock
38	$\overline{\text{CLDCK}}$	O	Sub-code frame clock (f=7.35kHz) (Not used, open)
39	BLKCK	O	Sub-code block clock (f=75Hz)
40	DEMPH	O	De-emphasis ON signal ("H": ON)
41	MEMP	I	Emphasis signal
42	MLD	I	Command load signal ("L": LOAD)
43	MCLK	I	Command clock signal
44	MDATA	I	Command data signal
45	D MUTE	I	Muting input ("H": MUTE)
46	SMCK	O	System clock (f=4.2336MHz)
47	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
48	CRC	O	Sub-code CRC check terminal ("H": OK, "L": NG)
49	SUBC	O	Sub-code serial output data (Not used, open)
50	SBCK	I	Sub-code serial output clock (Not used, open)
51	$\overline{\text{TRON}}$	I	Tracking servo ON signal ("L": ON)
52	CLVS	O	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo)
53	PC	O	Turntable motor ON signal ("L": ON)
54	ECM	O	Turntable motor drive signal (Forced mode)
55	ECS	O	Turntable motor drive signal (Servo error signal)
56	VDD	I	Power supply terminal
57	$\overline{\text{TEST}}$	I	Test terminal (Normal: "H")
58	SSEL	I	"SUBQ" terminal mode select ("H": Q code buffer)
59	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz)
60	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
61	DO	I	Drop-out detection signal ("H": Drop-out) (Not used, connected to GND)
62	EFM	O	EFM signal (Not used, open)
63	PCK	O	PLL extract clock (f=4.3218MHz)
64	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)

• IC801 (MN6474): Digital filter & D/A converter

Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	RSTB	I	Reset command
3	IE	I	Not used, connected to GND
4	TP1	—	TEST terminal
5	TP2	—	
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	—	Not connected
9	NC	—	Not connected
10	AVDD4	I	Power supply (connected to +4.8V)
11	OUTL (−)	O	Lch data output, (−) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTL (+)	O	Lch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +4.8V)
16	NC	—	Not connected
17	AVDD2	I	Power supply (connected to +4.8V)
18	OUTR (+)	O	Rch data output, (+) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTR (−)	O	Rch data output, (−) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +4.8V)
23	DVDD1	I	Power supply (connected to +4.9V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not connected
28	DVDD2	I	Power supply (connected to +4.9V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Sub-strate terminal (Not used, connected to +4.9V)
31	ZFLGB	O	Zero input detector terminal (Not used, open)
32	192fs	O	192 fs (8.4672MHz) (Not used, open)
33	LRPOL	I	LR clock selector (Not used, connected to +4.9V)
34	LRCLK	I	LR discrimination signal input
35	BCLK	I	Serial bit clock input
36	SRDATA	I	Serial data input (MSB first)
37	DVSS 3	I	GND terminal (digital system)
38	DVDD	I	Power supply (connected to +4.9V)
39	384 fs	O	384 fs (16.9344MHz) output
40	PD	I	Power down terminal (Not used, connected to GND)
41	MDATA	I	Mode control data
42	MCLK	I	Data clock for MDATA

• IC703 (AN8377N): Traverse motor drive

Pin No.	Mark	I/O Division	Function
1	P V_{CC}	I	Drive power supply
2	V_{CC}	I	Power supply terminal
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output
5	TVD1	I	Traverse error signal input
6	TD1	I	Tracking error signal input
7	FD1	I	Focus error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	FD+	O	Non-inverting output of focus driver
10	FD−	O	Inverting output of focus driver
11	TD+	O	Non-inverting output of tracking driver
12	TD−	O	Inverting output of tracking driver
13	TVD+	O	Non-inverting output of traverse driver
14	TVD−	O	Inverting output of driver
15	/RST	O	Reset signal output
16	PC	I	PC input (connect to GND)

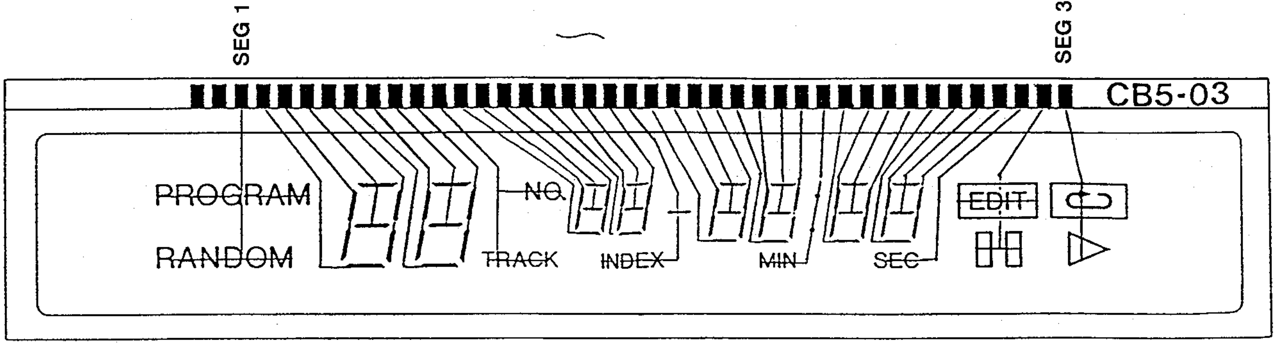
- **IC602 (LC7582A): LCD drive**

Pin No.	Mark	I/O Division	Function
1 ~ 23	S1 ~ S23	O	LCD segment signal
24	NC	—	(Not connected)
25 ~ 40	S24 ~ S39	O	LCD segment signal
41 ~ 54	S40 ~ S53	—	(Not used, open)
55	OSC	I	Crystal OSC terminal
56	V_{DD}	I	Power supply terminal

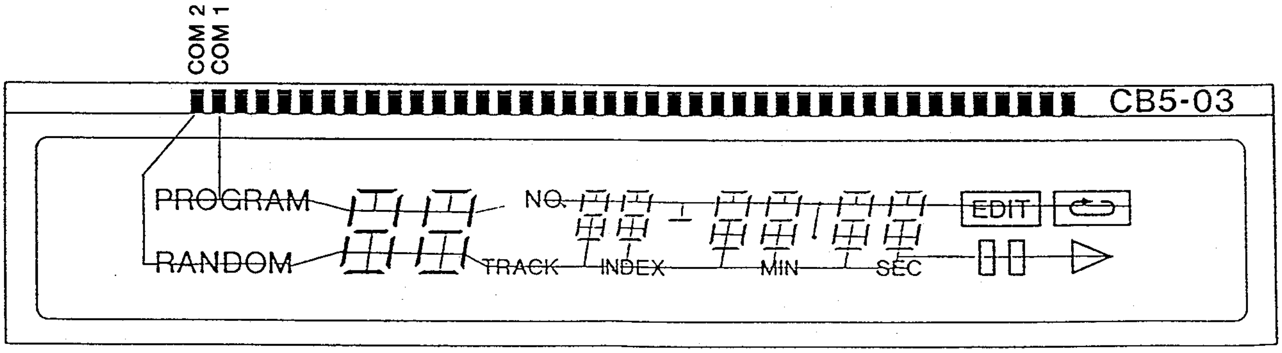
Pin No.	Mark	I/O Division	Function
57	$\overline{INH}$	I	Remote control signal
58	VLCD	I	Reference voltage terminal
59	V_{SS}	—	GND terminal
60	CE	I/O	Chip enable terminal
61	CLK	I	Serial clock signal
62	DATA	I	Serial data signal
63	COM 2	O	LCD common terminal
64	COM 1		

INTERNAL CONNECTIONS OF LCD

- **Segment connection diagram**


SEG 1
SEG 39
CB5-03
PROGRAM
RANDOM
NO.
TRACK
INDEX
MIN
SEC
EDIT

- **Common connection diagram**

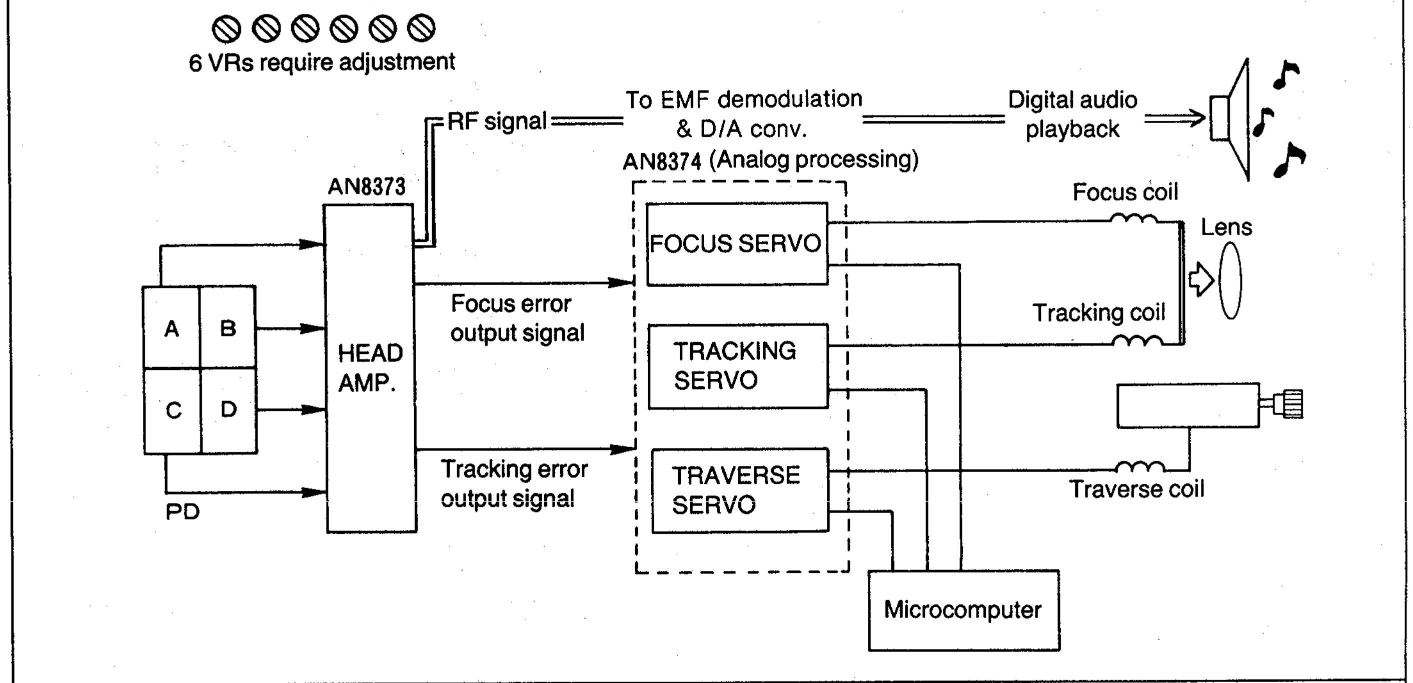

COM 2
COM 1
CB5-03
PROGRAM
RANDOM
NO.
TRACK
INDEX
MIN
SEC
EDIT

DIGITAL SERVO SYSTEM

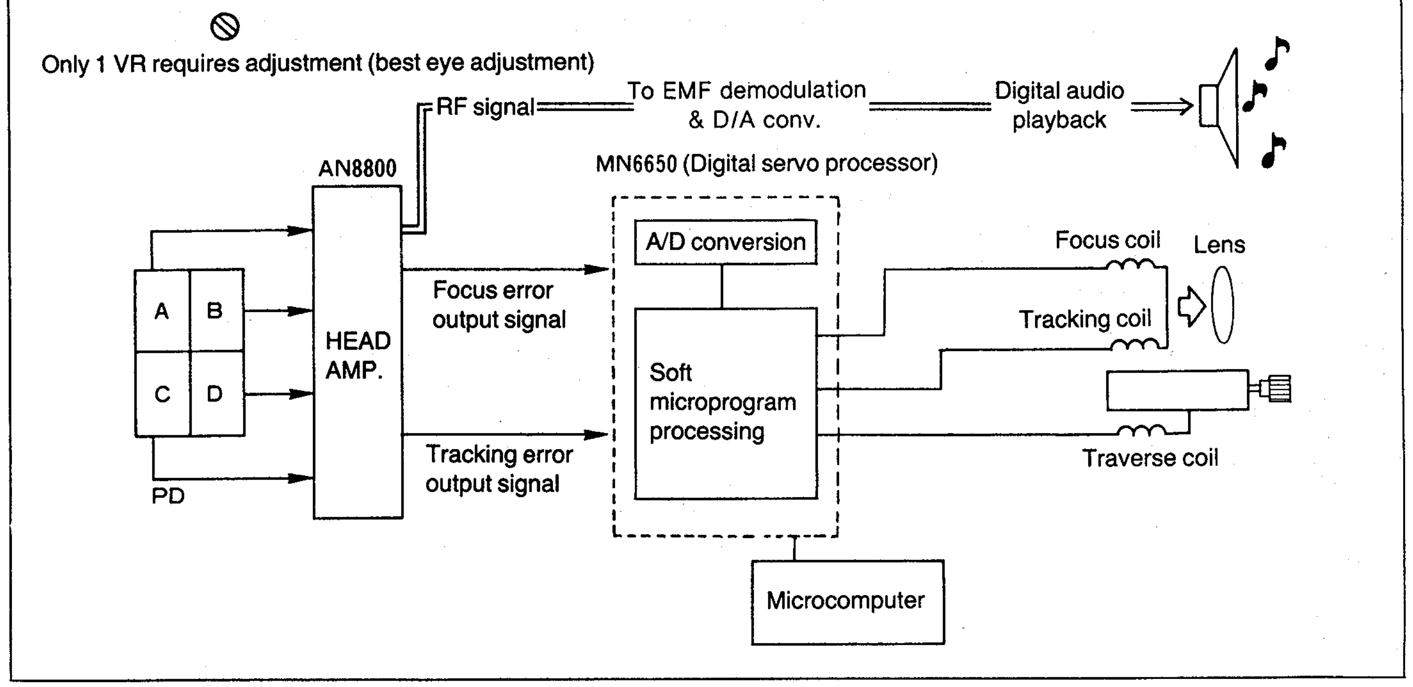
The newly-developed digital servo system is adopted in the servo circuit of the unit's CD player instead of the ordinary analog servo system.

1. The diagrams shown below represent differences between the analog servo and digital servo systems. The HEAD AMP. output signals (i.e., focus error and tracksing error output signals) are analog. These analog signals are converted to the 8-bit digital signals through the MN6650. The MN6650 performs the following adjustments automatically; focus offset, tracking offset, focus gain, tracking gain, and tracking balance adjustments. The outputs from the MN6650 such as the focus coil driving signal, tracking coil driving signal, and traverse motor driving signal are converted to analog signals again and sent to the coils and motor to perform proper servo control for a disc.

ANALOG SERVO SYSTEM


6 VRs require adjustment
RF signal
To EMF demodulation & D/A conv.
Digital audio playback
AN8374 (Analog processing)
AN8373
FOCUS SERVO
Focus coil
Lens
Focus error output signal
TRACKING SERVO
Tracking coil
A
B
C
D
HEAD AMP.
Tracking error output signal
TRAVERSE SERVO
Traverse coil
PD
Microcomputer

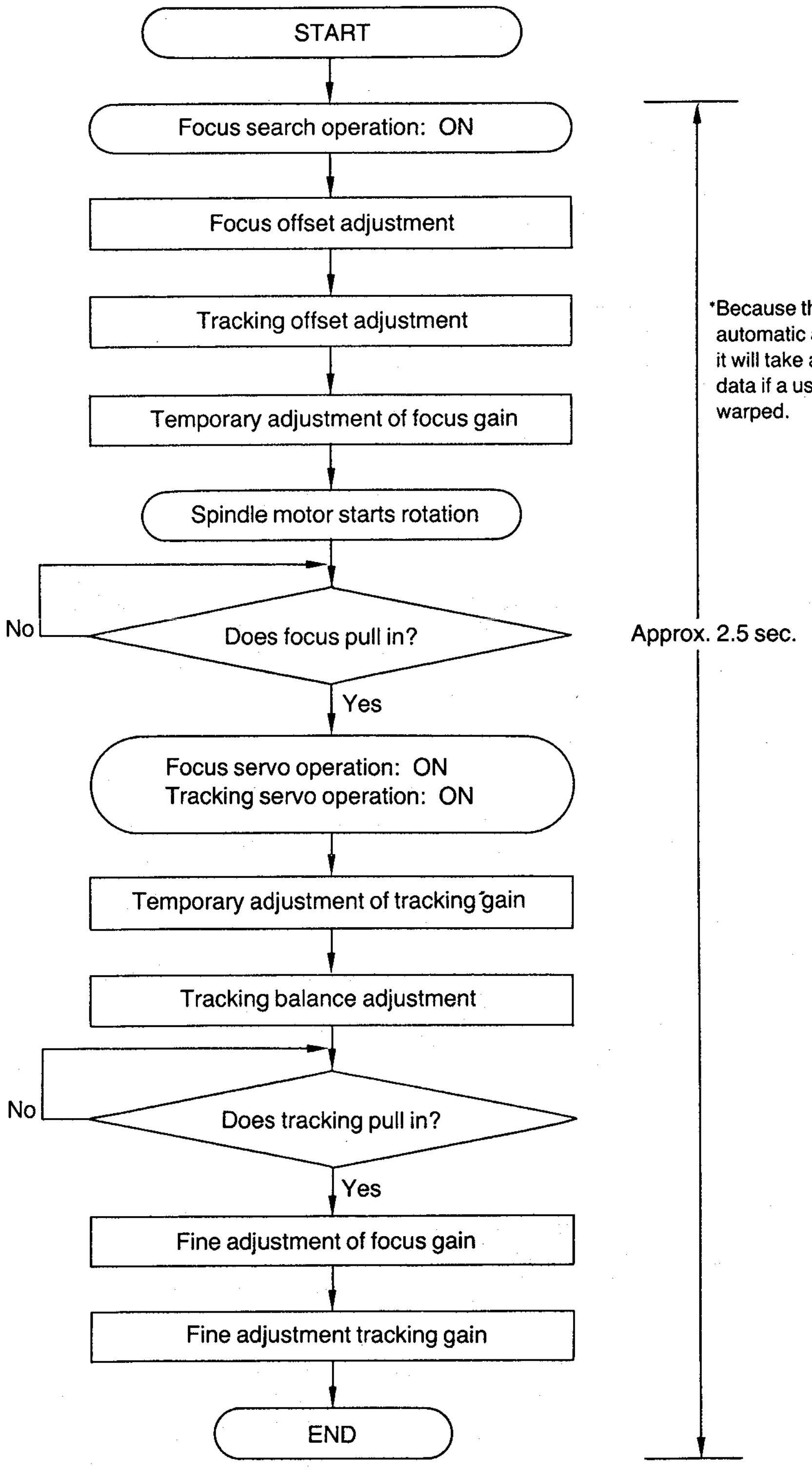
DIGITAL SERVO SYSTEM


Only 1 VR requires adjustment (best eye adjustment)
RF signal
To EMF demodulation & D/A conv.
Digital audio playback
AN8800
MN6650 (Digital servo processor)
A/D conversion
Focus coil
Lens
Focus error output signal
Tracking coil
A
B
C
D
HEAD AMP.
Soft microprogram processing
Tracking error output signal
Traverse coil
PD
Microcomputer

2. The servo processor IC MN6650 of the newly-developed digital servo circuit automatically performs the following adjustments which were originally adjusted manually in the conventional analog servo circuit:
(1) Focus offset, (2) Tracking offset, (3) Focus gain, (4) Tracking gain, and (5) Tracking balance. Therefore, you do not have to perform the above-mentioned electrical adjustments. The unit optimizes the servo for each loaded disc.
[You must perform the best eye (PD balance) adjustment manually.]

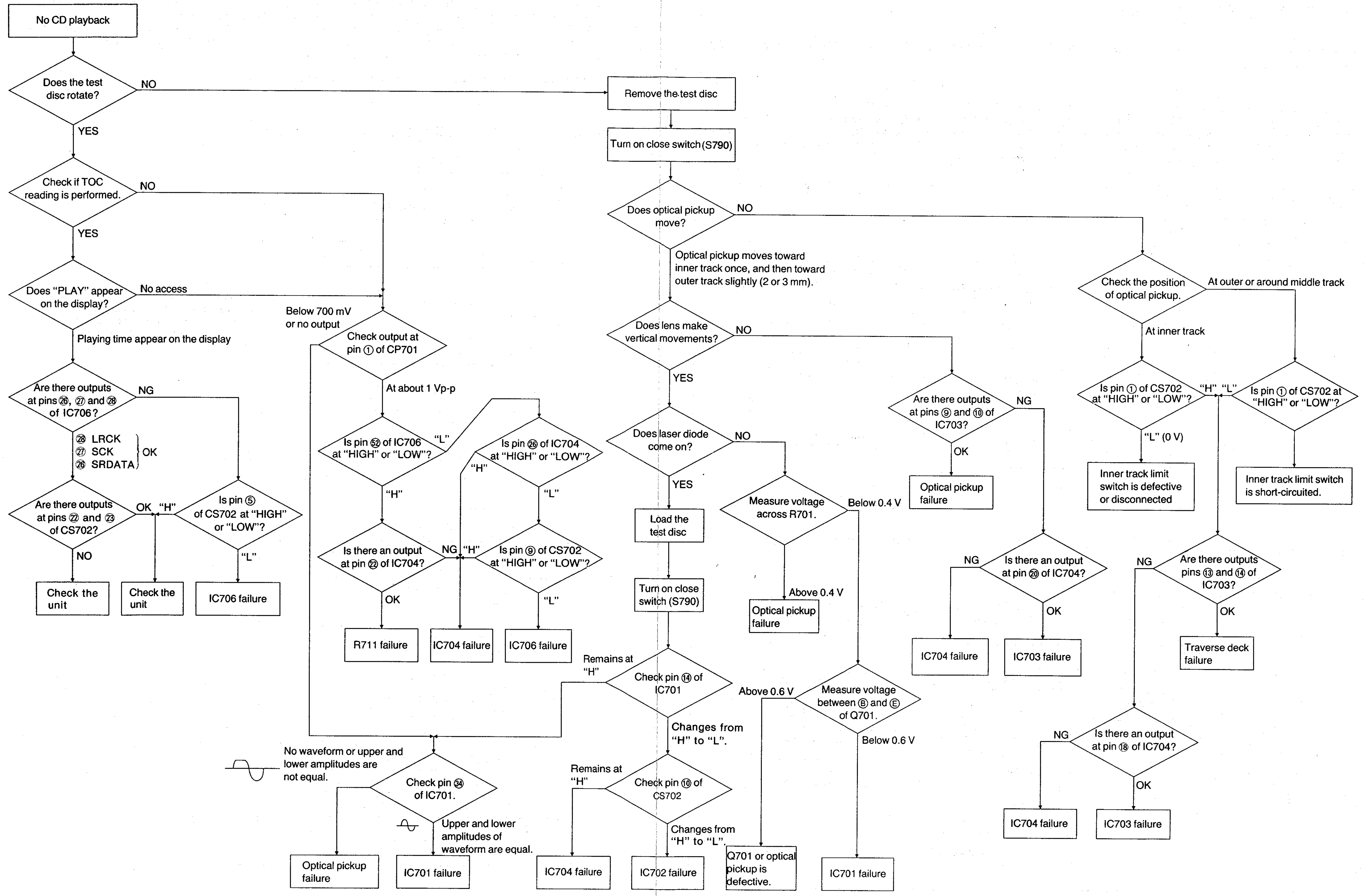
The following flow chart shows the sequence of automatic adjustments.

•Flow chart on automatic adjustment sequence

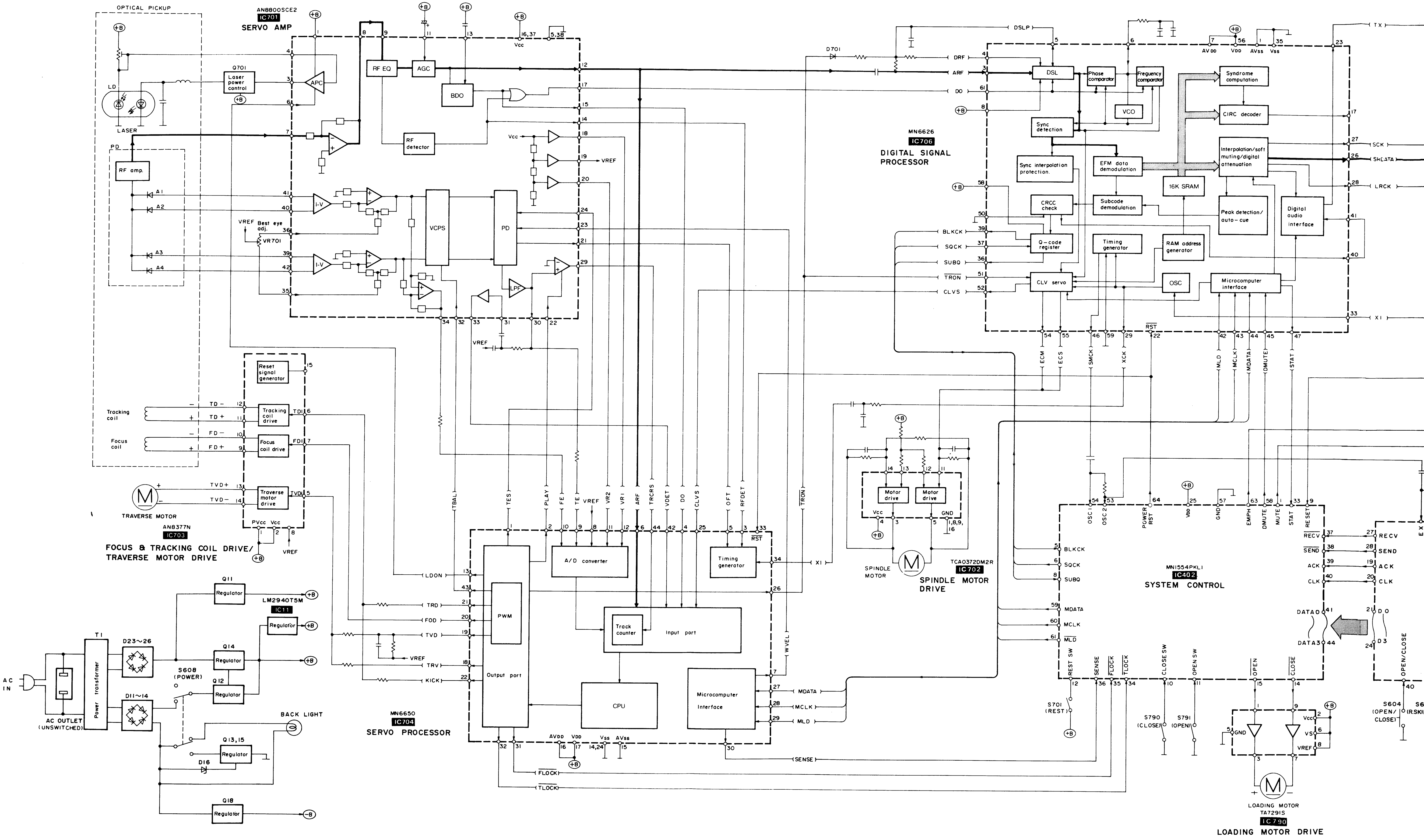

START
Focus search operation: ON
Focus offset adjustment
Tracking offset adjustment
Temporary adjustment of focus gain
Spindle motor starts rotation
No
Does focus pull in?
Yes
Focus servo operation: ON
Tracking servo operation: ON
Temporary adjustment of tracking gain
Tracking balance adjustment
No
Does tracking pull in?
Yes
Fine adjustment of focus gain
Fine adjustment tracking gain
END
Approx. 2.5 sec.

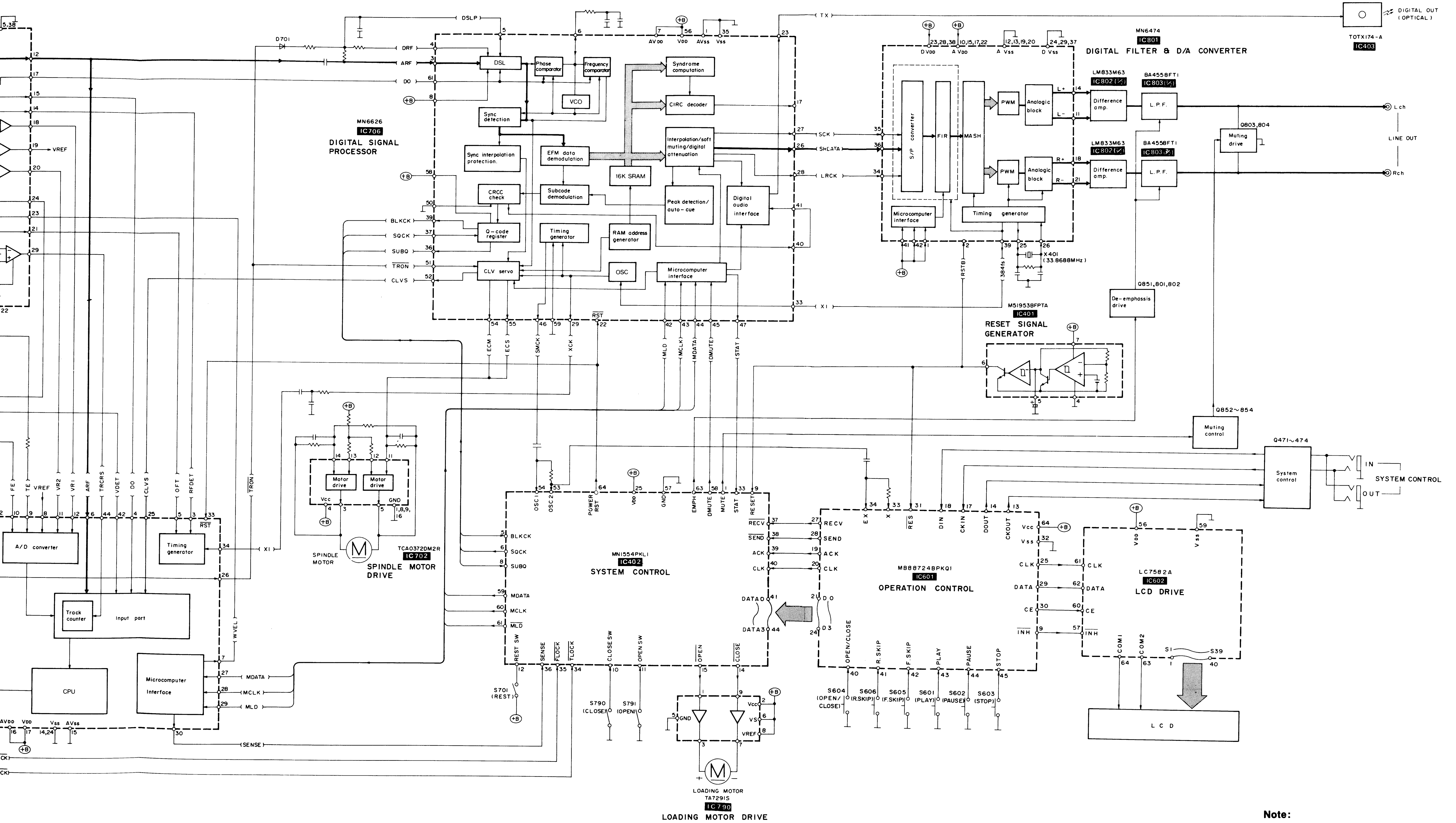
*Because the microcomputer precisely performs automatic adjustments as shown in the flow chart, it will take approx. 5 seconds to finish reading TOC data if a used disc is eccentric one or its surface is warped.

TROUBLESHOOTING GUIDE


No CD playback
Does the test disc rotate?
NO
YES
Remove the test disc
Turn on close switch (S790)
Check if TOC reading is performed.
NO
YES
Does "PLAY" appear on the display?
No access
Playing time appear on the display
Below 700 mV or no output
Check output at pin ① of CP701
At about 1 Vp-p
Are there outputs at pins ㉖, ㉗ and ㉘ of IC706?
NG
㉘ LRCK
㉗ SCK
㉖ SRDATA
OK
Are there outputs at pins ㉒ and ㉓ of CS702?
OK
"H"
Is pin ⑤ of CS702 at "HIGH" or "LOW"?
"L"
NO
Check the unit
Check the unit
IC706 failure
Is pin (52) of IC706 at "HIGH" or "LOW"?
"L"
"H"
Is pin ㉖ of IC704 at "HIGH" or "LOW"?
"H"
"L"
Is there an output at pin ㉒ of IC704?
NG
"H"
Is pin ⑨ of CS702 at "HIGH" or "LOW"?
OK
"L"
R711 failure
IC704 failure
IC706 failure
Does optical pickup move?
NO
Optical pickup moves toward inner track once, and then toward outer track slightly (2 or 3 mm).
Does lens make vertical movements?
NO
YES
Does laser diode come on?
NO
YES
Load the test disc
Turn on close switch (S790)
Measure voltage across R701.
Below 0.4 V
Above 0.4 V
Optical pickup failure
Remains at "H"
Check pin ⑭ of IC701
Changes from "H" to "L".
Above 0.6 V
Measure voltage between Ⓑ and Ⓔ of Q701.
Below 0.6 V
No waveform or upper and lower amplitudes are not equal.
Check pin (34) of IC701.
Upper and lower amplitudes of waveform are equal.
Optical pickup failure
IC701 failure
Remains at "H"
Check pin ⑩ of CS702
Changes from "H" to "L".
IC704 failure
IC702 failure
Q701 or optical pickup is defective.
IC701 failure
Are there outputs at pins ⑨ and ⑩ of IC703?
NG
OK
Optical pickup failure
Is there an output at pin ⑳ of IC704?
NG
OK
IC704 failure
IC703 failure
Check the position of optical pickup.
At outer or around middle track
At inner track
Is pin ① of CS702 at "HIGH" or "LOW"?
"H"
"L"
Is pin ① of CS702 at "HIGH" or "LOW"?
"L" (0 V)
Inner track limit switch is defective or disconnected
Inner track limit switch is short-circuited.
Are there outputs pins ⑬ and ⑭ of IC703?
NG
OK
Traverse deck failure
Is there an output at pin ⑱ of IC704?
NG
OK
IC704 failure
IC703 failure

■ BLOCK DIAGRAM


OPTICAL PICKUP
LD
LASER
PD
RF amp.
A1
A2
A3
A4
Q701
Laser power control
AN8800SCE2
IC701
SERVO AMP
APC
RF EQ
AGC
BDO
RF detector
I-V
VCPS
PD
LPF
VREF
Best eye adj.
VR701
Vcc
Reset signal generator
Tracking coil drive
Focus coil drive
Traverse motor drive
Tracking coil
Focus coil
TD−
TD+
FD−
FD+
TVD+
TVD−
TRAVERSE MOTOR
AN8377N
IC703
FOCUS & TRACKING COIL DRIVE/
TRAVERSE MOTOR DRIVE
PVcc Vcc
Q11
Regulator
LM2940T5M
IC11
Q14
Q12
Q13,15
Q18
D23~26
D11~14
D16
T1
Power transformer
S608 (POWER)
AC IN
AC OUTLET (UNSWITCHED)
BACK LIGHT
MN6650
IC704
SERVO PROCESSOR
A/D converter
Timing generator
PWM
Output port
Track counter
Input port
CPU
Microcomputer interface
TBAL
TES
PLAY
FE
TE
VR2
VR1
ARF
TRCRS
VDET
DO
CLVS
OFT
RFDET
TRON
WVEL
LDON
TRD
FOD
TVD
TRV
KICK
MDATA
MCLK
MLD
SENSE
FLOCK
TLOCK
XI
RST
D701
DSLP
DRF
ARF
DO
MN6626
IC706
DIGITAL SIGNAL PROCESSOR
DSL
Phase comparator
Frequency comparator
VCO
Sync detection
Sync interpolation protection.
EFM data demodulation
Syndrome computation
CIRC decoder
Interpolation/soft muting/digital attenuation
16K SRAM
CRCC check
Subcode demodulation
Peak detection/auto-cue
Digital audio interface
Q-code register
Timing generator
RAM address generator
CLV servo
OSC
Microcomputer interface
BLKCK
SQCK
SUBQ
TRON
CLVS
TX
SCK
SRDATA
LRCK
AV DD
VDD
AVss
Vss
ECM
ECS
SMCK
XCK
MLD
MCLK
MDATA
DMUTE
STAT
Motor drive
SPINDLE MOTOR
TCA0372DM2R
IC702
SPINDLE MOTOR DRIVE
MN1554PKL1
IC402
SYSTEM CONTROL
OSC1
OSC2
POWER RST
EMPH
RESET
RECV
SEND
ACK
CLK
DATA0
DATA3
D0
D3
REST SW
CLOSE SW
OPEN SW
OPEN
CLOSE
S701 (REST)
S790 (CLOSE)
S791 (OPEN)
S604 (OPEN/CLOSE)
(R.SKI
LOADING MOTOR
TA7291S
IC790
LOADING MOTOR DRIVE
+B
−B


MN6626
IC706
DIGITAL SIGNAL PROCESSOR
DSL
Phase comparator
Frequency comparator
VCO
Sync detection
Syndrome computation
CIRC decoder
Interpolation/soft muting/digital attenuation
Sync interpolation protection.
EFM data demodulation
16K SRAM
CRCC check
Subcode demodulation
Peak detection/auto-cue
Digital audio interface
Q-code register
Timing generator
RAM address generator
CLV servo
OSC
Microcomputer interface
DSLP
DRF
ARF
DO
D701
BLKCK
SQCK
SUBQ
TRON
CLVS
SCK
SRDATA
LRCK
TX
XI
ECM
ECS
SMCK
XCK
RST
MLD
MCLK
MDATA
DMUTE
STAT
AVDD
VDD
AVss
Vss
MN6474
IC801
DIGITAL FILTER & D/A CONVERTER
S/P converter
FIR
MASH
PWM
Analogic block
Microcomputer interface
Timing generator
D VDD
A VDD
A Vss
D Vss
L+
L-
R+
R-
X401 (33.8688MHz)
384fs
RSTB
LM833M63
IC802(1/2)
IC802(2/2)
Difference amp.
BA4558FT1
IC803(1/2)
IC803(2/2)
L.P.F.
Q803,804
Muting drive
Lch
Rch
LINE OUT
TOTX174-A
IC403
DIGITAL OUT (OPTICAL)
M51953BFPTA
IC401
RESET SIGNAL GENERATOR
Q851,801,802
De-emphassis drive
Q852~854
Muting control
Q471~474
System control
IN
OUT
SYSTEM CONTROL
A/D converter
Timing generator
Track counter
Input port
CPU
Microcomputer Interface
FE
TE
VREF
VR2
VR1
ARF
TRCRS
VDET
DO
CLVS
OFT
RFDET
TRON
WVEL
SENSE
MDATA
MCLK
MLD
TCA0372DM2R
IC702
SPINDLE MOTOR DRIVE
Motor drive
SPINDLE MOTOR
M
MN1554PKL1
IC402
SYSTEM CONTROL
OSC1
OSC2
POWER RST
VDD
GND
EMPH
DMUTE
MUTE
STAT
RESET
RECV
SEND
ACK
CLK
DATA0
DATA3
REST SW
SENSE
FLOCK
TLOCK
CLOSE SW
OPEN SW
OPEN
CLOSE
S701 (REST)
S790 (CLOSE)
S791 (OPEN)
LOADING MOTOR
TA7291S
IC790
LOADING MOTOR DRIVE
MB88724BPKQ1
IC601
OPERATION CONTROL
EX
X
RES
DIN
CKIN
DOUT
CKOUT
D0
D3
OPEN/CLOSE
R.SKIP
F.SKIP
PLAY
PAUSE
STOP
S604 (OPEN/CLOSE)
S606 (R.SKIP)
S605 (F.SKIP)
S601 (PLAY)
S602 (PAUSE)
S603 (STOP)
LC7582A
IC602
LCD DRIVE
CE
INH
COM1
COM2
S1
S39
LCD

Note:

→ Digital/audio signal

■ SCHEMATIC DIAGRAM (Parts list on pages 45~48.)

(This schematic diagram may be modified at any time with development of new technology.)

Note:

- S601 : Play (▶ PLAY) switch.
- S602 : Pause (▮▮ PAUSE) switch.
- S603 : Stop (■ STOP) switch.
- S604 : Disc holder open/close (▲ OPEN/CLOSE) switch.
- S605, 606 : Skip/search (⏮◀-SKIP-SEARCH ▶⏭) switches.
  [S605: ▶⏭ (F), S606: ⏮◀ (R)]
- S608 : Power (POWER) switch in "ON" position.
- S701 : Rest detector switch in "OFF" position.
- S790 : Disc holder "close" detector switch.
- S791 : Disc holder "open" detector switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

  The supply part number is described alone in the replacement parts list.

Part No.	Production Part No.	Supply Part No.
IC11	LM2940T5M	LM2940T5
IC803	BA4558FT1	SVIBA4558F

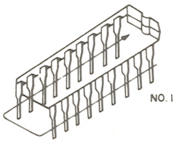
- — / - - - : Positive voltage lines and negative voltage lines.
  ⇢ : Digital/audio signal lines.

Caution!

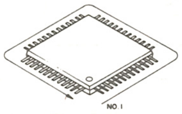
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

• Terminal guide of IC's, transistors and diodes

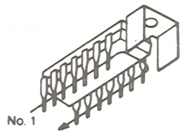


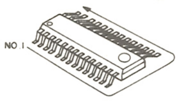
MB88724BPKQ1	64 Pin



MN6474	42 Pin
MN6650	44 Pin
MN6626	64 Pin
MN1554PKL1	
LC7582A	

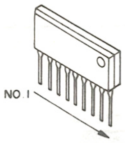
AN8377N	16 Pin



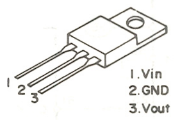


AN8800SCE2	42 Pin
TCA0372DM2R	16 Pin
BA4558FT1	8 Pin
LM833M63	
M51953BFPTA	

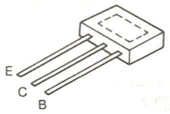
TA7291S	9 Pin



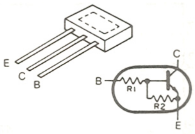
LM2940T5M



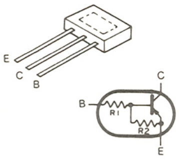
2SC3311QRSTA,
2SC3311ARSTA,
2SD1450RSTTA,
2SA1309QRSTA



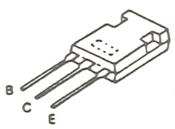
UN4212TA,
DTC144ESTP



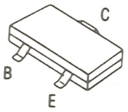
UN4112TA,
DTA114ESTP



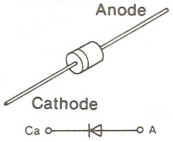
2SD2037EFTA



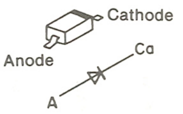
2SB709STW



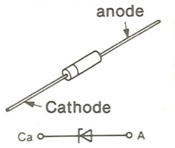
1SS254TA,
SVD1SR35200V,
MA700TA



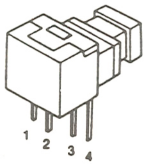
MA110TW



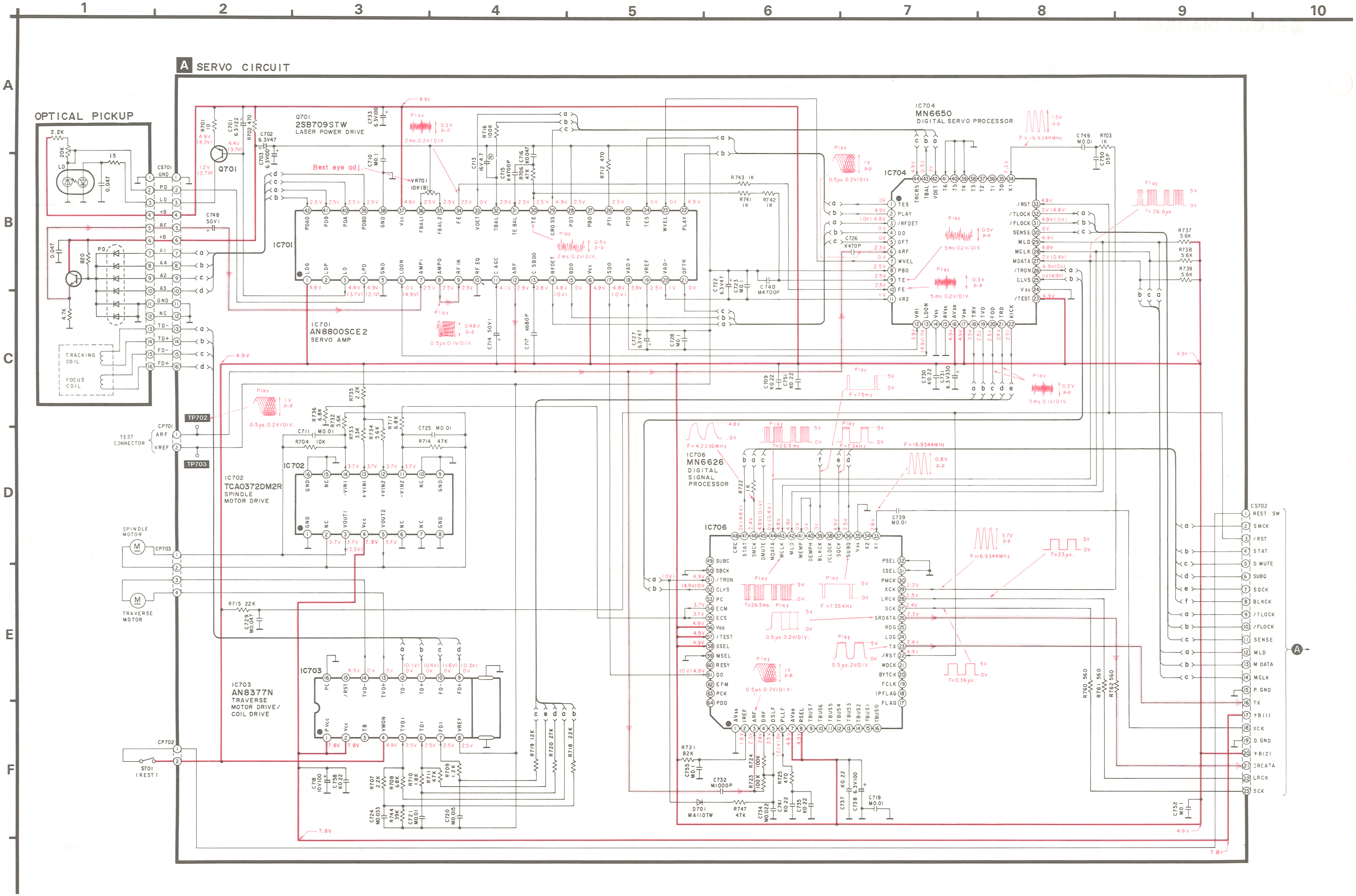
MA4068MTA,
MA4082MTA,
MA4120MTA

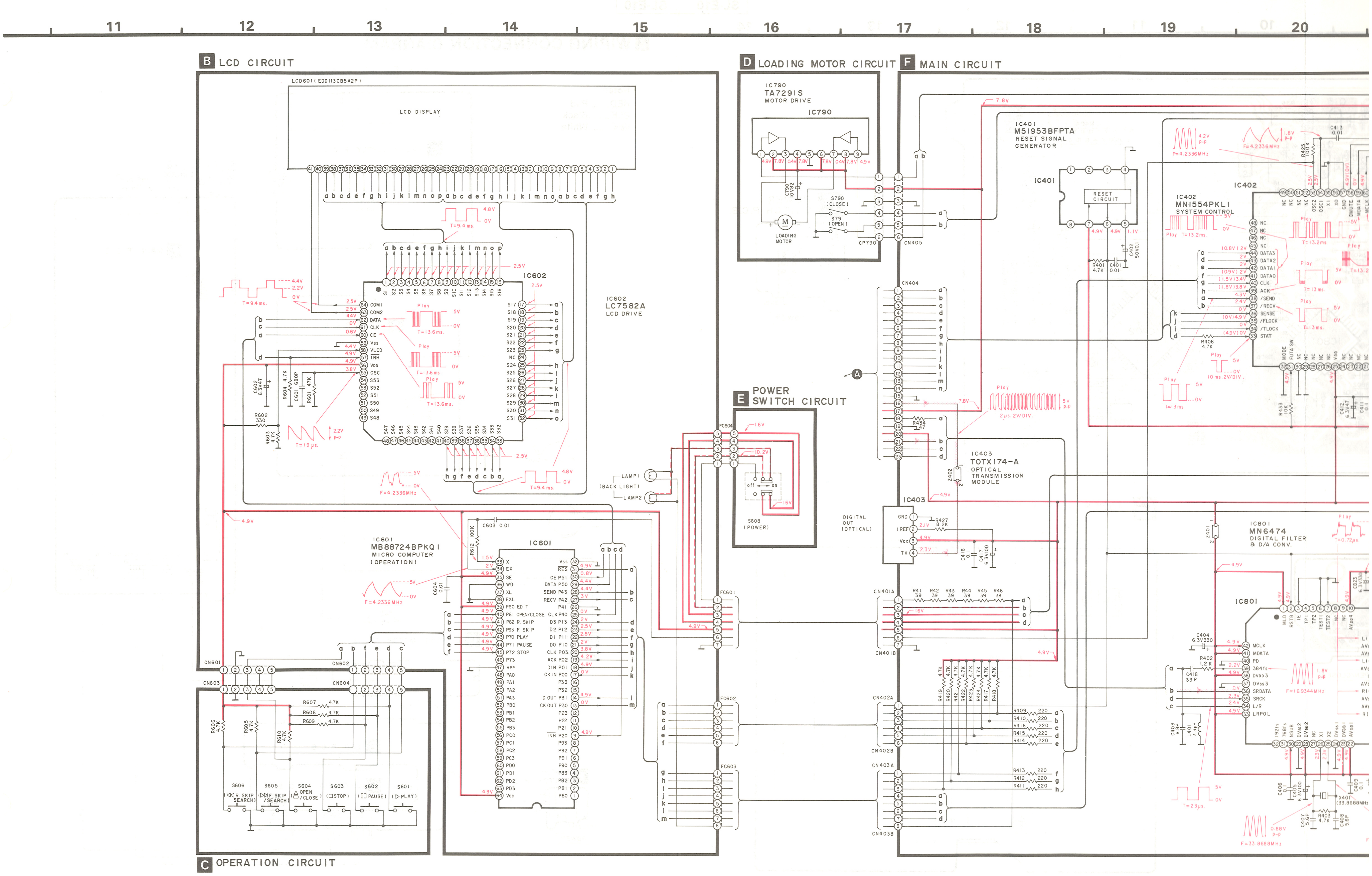


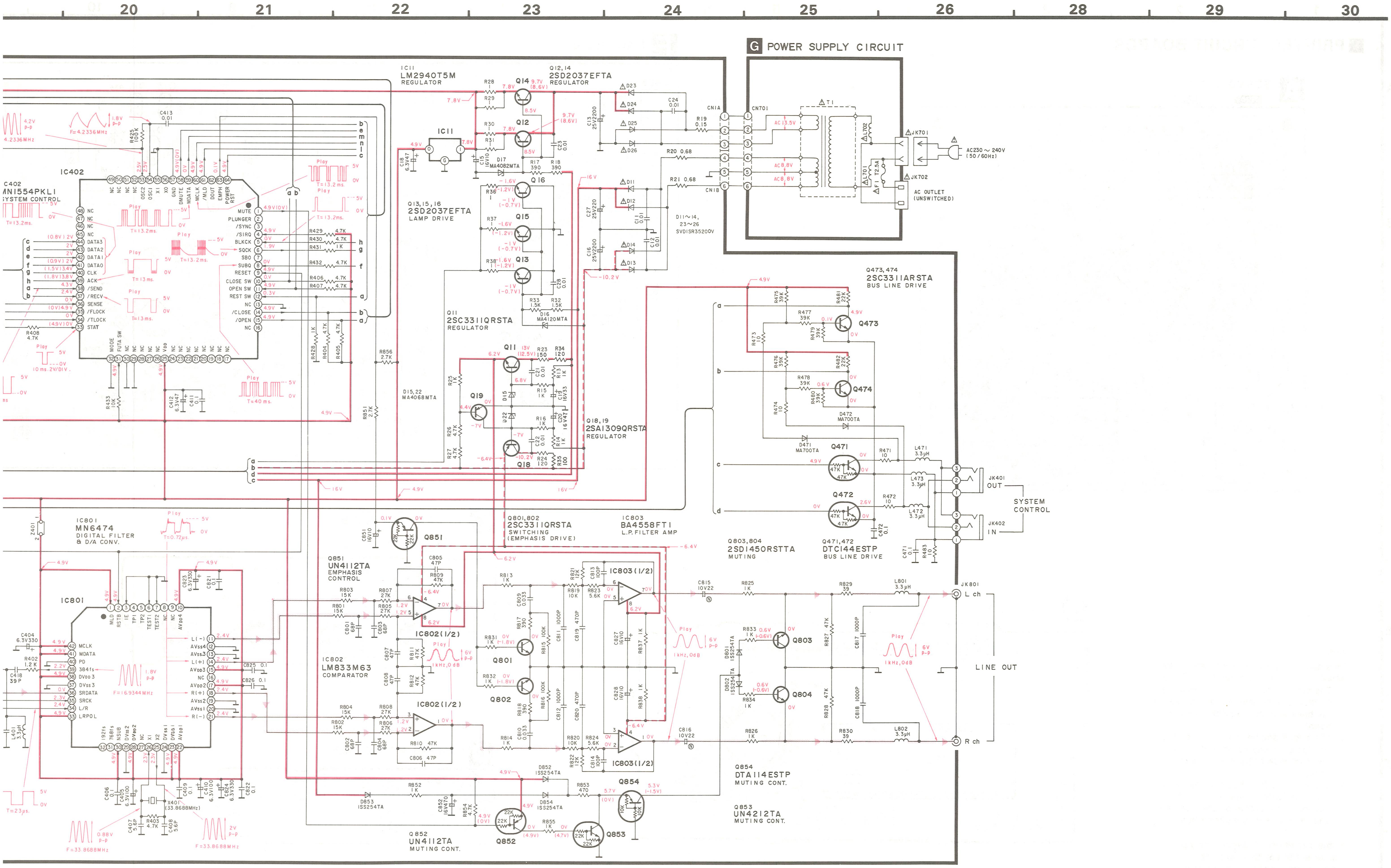
TOTX174-A



A SERVO CIRCUIT

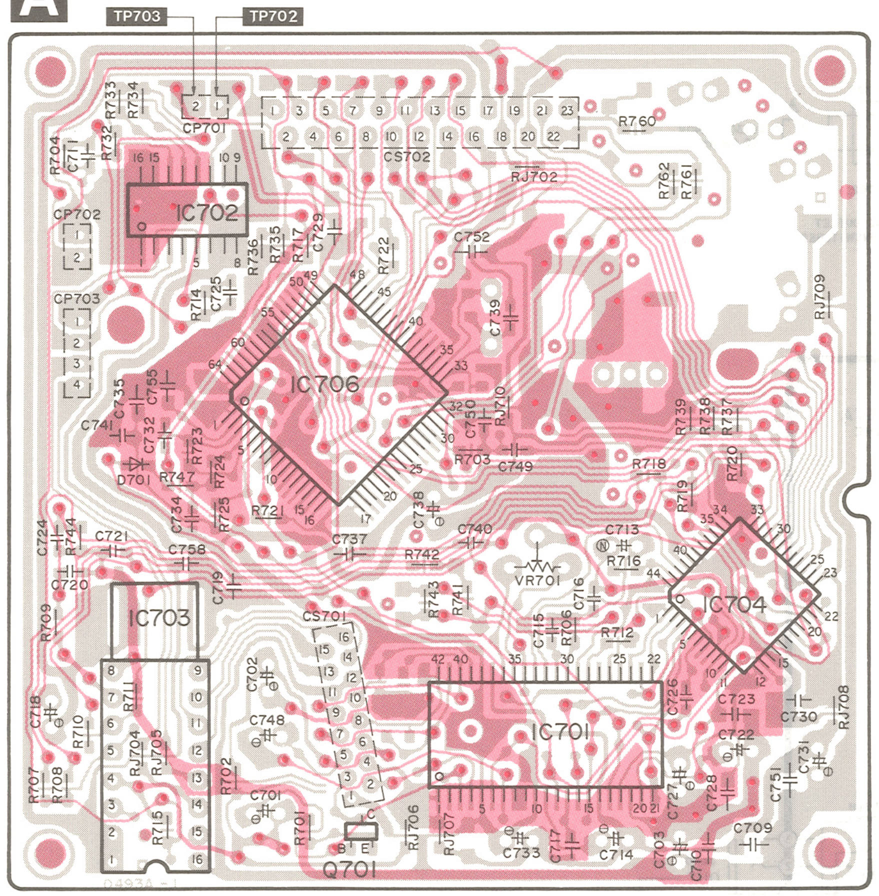

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
OPTICAL PICKUP
LD
PD
TRACKING COIL
FOCUS COIL
CS701
GND
PD
LD
+B
RF
+B
A1
A4
A2
A3
GND
NC
TD-
TD+
FD-
FD+
Q701
2SB709STW
LASER POWER DRIVE
Best eye adj.
VR701 10K(B)
IC701
AN8800SCE2
SERVO AMP
PDAD
PDB
PDA
PDBD
GND
Vcc
FBAL1
FBAL2
FE
VDET
TBAL
TE BAL
TE
CROSS
POT
PBO
PTI
PTO
TES
WVEL
PLAY
LDG
LDP
LD
LPD
LDON
AMPI
AMPO
RF IN
RF EQ
C AGC
ARF
C SBDO
RFDET
BDO
SDO
VAD+
VREF
VAD-
OFTR
IC704
MN6650
DIGITAL SERVO PROCESSOR
TES
PLAY
/RFDET
DO
OFT
ARF
WVEL
PBO
TE
FE
VR2
/RST
/TLOCK
/FLOCK
SENSE
MLD
MCLK
MDATA
/TRON
CLVS
Vss
/TEST
F=16.9344MHz
T=26.5μs
CP701
ARF
VREF
TEST CONNECTOR
TP702
TP703
IC702
TCA0372DM2R
SPINDLE MOTOR DRIVE
SPINDLE MOTOR
CP703
TRAVERSE MOTOR
IC703
AN8377N
TRAVERSE MOTOR DRIVE/COIL DRIVE
CP702
S701
(REST)
IC706
MN6626
DIGITAL SIGNAL PROCESSOR
SUBC
SBCK
/TRON
CLVS
PC
ECM
ECS
VDD
/TEST
SSEL
MSEL
RESY
DO
EFM
PCK
PDO
PSEL
CSEL
PMCK
XCK
LRCK
SCK
SRDATA
RDG
LDG
TX
/RST
WDCK
BYTCK
FCLK
IPFLAG
FLAG
F=4.2336MHz
F=7.35KHz
T=0.36μs
T=23μs
CS702
REST SW
SMCK
/RST
STAT
D.MUTE
SUBQ
SQCK
BLKCK
/TLOCK
/FLOCK
SENSE
MLD
M DATA
MCLK
P.GND
TX
+B(1)
XCK
D.GND
+B(2)
SRDATA
LRCK
SCK
D701 MA110TW
Play
4.9V
7.8V


11
12
13
14
15
16
17
18
19
20
B LCD CIRCUIT
LCD601 (EDD113CB5A2P)
LCD DISPLAY
IC602
LC7582A
LCD DRIVE
IC601
MB88724BPKQ1
MICRO COMPUTER
(OPERATION)
F=4.2336MHz
T=9.4ms.
T=13.6ms.
T=19μs.
Play
CN601
CN602
CN603
CN604
R607 4.7K
R608 4.7K
R609 4.7K
R606 4.7K
R605 4.7K
R610 4.7K
S606 (⏮R. SKIP /SEARCH)
S605 (⏭F. SKIP /SEARCH)
S604 (⏏ OPEN /CLOSE)
S603 (◻STOP)
S602 (⏸ PAUSE)
S601 (▷ PLAY)
C OPERATION CIRCUIT
D LOADING MOTOR CIRCUIT
IC790
TA7291S
MOTOR DRIVE
S790 (CLOSE)
S791 (OPEN)
LOADING MOTOR
CP790
CN405
E POWER SWITCH CIRCUIT
S608 (POWER)
LAMP1
(BACK LIGHT)
LAMP2
FC601
FC602
FC603
FC604
F MAIN CIRCUIT
IC401
M51953BFPTA
RESET SIGNAL GENERATOR
RESET CIRCUIT
IC402
MN1554PKL1
SYSTEM CONTROL
IC403
TOTX174-A
OPTICAL TRANSMISSION MODULE
DIGITAL OUT (OPTICAL)
IC801
MN6474
DIGITAL FILTER & D/A CONV.
X401 (33.8688MHz)
F=4.2336MHz
F=16.9344MHz
F=33.8688MHz
CN404
CN401A
CN401B
CN402A
CN402B
CN403A
CN403B

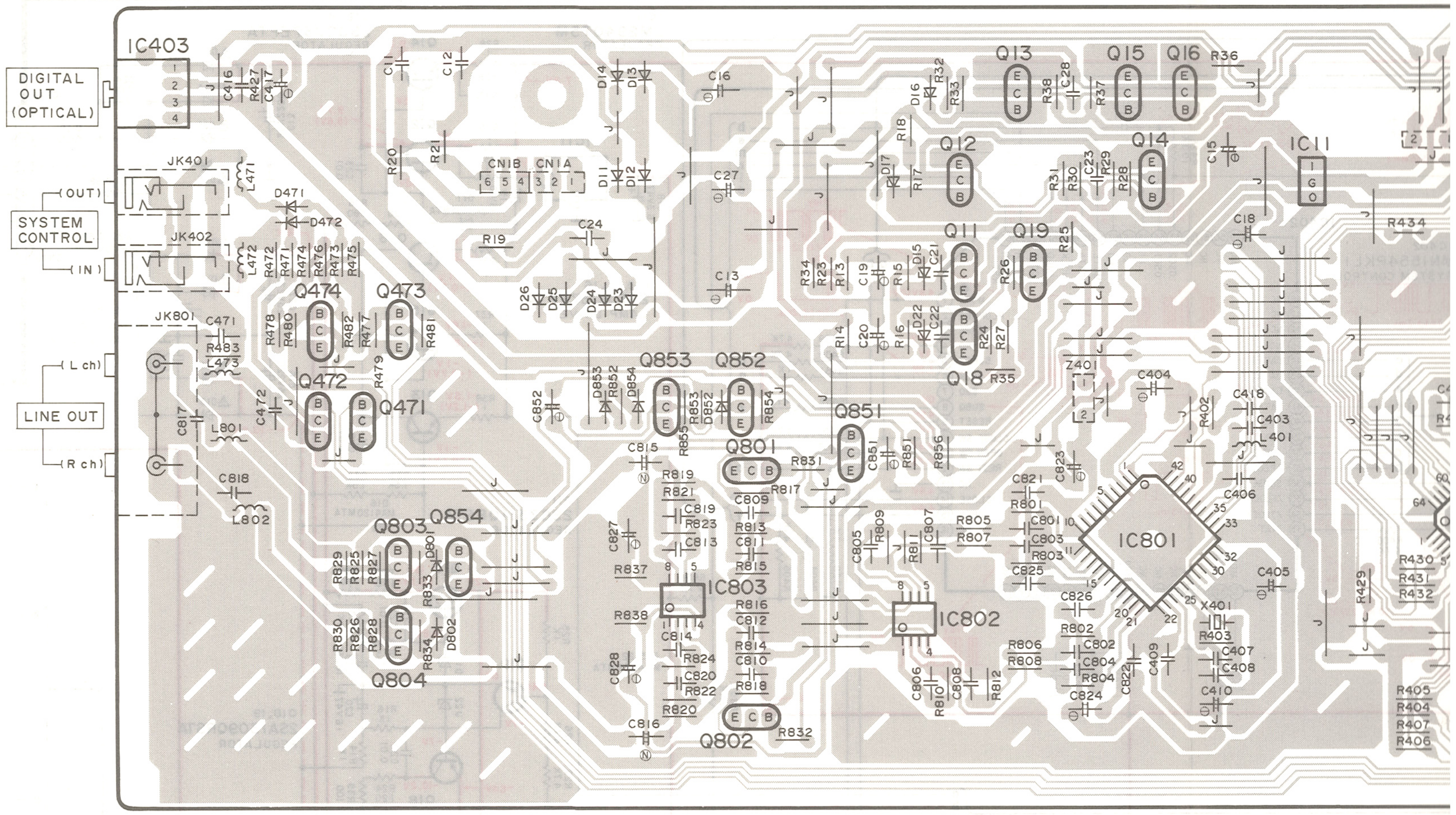

20
21
22
23
24
25
26
28
29
30
G POWER SUPPLY CIRCUIT
IC11 LM2940T5M REGULATOR
Q12, 14 2SD2037EFTA REGULATOR
Q13, 15, 16 2SD2037EFTA LAMP DRIVE
Q11 2SC3311QRSTA REGULATOR
Q18, 19 2SA1309QRSTA REGULATOR
D11~14, 23~26 SVDISR35200V
D15, 22 MA4068MTA
D16 MA4120MTA
D17 MA4082MTA
CN1A
CN1B
CN701
T1
JK701
JK702
AC230 ~ 240V (50/60Hz)
AC OUTLET (UNSWITCHED)
F1 T2.5A
L701
L702
AC 13.5V
AC 8.8V
IC402 MN1554PKLI SYSTEM CONTROL
MUTE
PLUNGER
/SYNC
/SIRQ
BLKCK
SQCK
SBO
SUBQ
RESET
CLOSE SW
OPEN SW
REST SW
/CLOSE
/OPEN
DATA3
DATA2
DATA1
DATA0
ACK
CLK
/SEND
/RECV
SENSE
/FLOCK
/TLOCK
STAT
4.2V P-P
4.2336MHz
F=4.2336MHz
1.8V P-P
T=13.2ms.
T=13ms.
T=40 ms.
10 ms.2V/DIV.
Play
Q473, 474 2SC3311ARSTA BUS LINE DRIVE
Q473
Q474
Q471
Q472
D471 MA700TA
D472 MA700TA
Q471, 472 DTC144ESTP BUS LINE DRIVE
L471 3.3μH
L472 3.3μH
L473 3.3μH
JK401 OUT
JK402 IN
SYSTEM CONTROL
IC801 MN6474 DIGITAL FILTER & D/A CONV.
MCLK
MDATA
PD
384fs
SRDATA
SRCK
L/R
LRPOL
X401 (33.8688MHz)
F=16.9344MHz
F=33.8688MHz
T=0.72μs
T=23μs
Q851 UN4112TA EMPHASIS CONTROL
Q851
Q801, 802 2SC3311QRSTA SWITCHING (EMPHASIS DRIVE)
Q801
Q802
IC802 LM833M63 COMPARATOR
IC802(1/2)
IC803 BA4558FTI L.P.FILTER AMP
IC803(1/2)
Q803, 804 2SD1450RSTTA MUTING
Q803
Q804
D801 1SS254TA
D802 1SS254TA
D852 1SS254TA
D853 1SS254TA
D854 1SS254TA
Q854 DTA114ESTP MUTING CONT.
Q853 UN4212TA MUTING CONT.
Q852 UN4112TA MUTING CONT.
Q852
Q853
Q854
1kHz, 0dB
6V P-P
L801 3.3μH
L802 3.3μH
JK801
L ch
R ch
LINE OUT

PRINTED CIRCUIT BOARDS

A SERVO P.C.B.


TP703
TP702
CP701
CS702
R760
RJ702
IC702
CP702
CP703
IC706
IC704
IC703
IC701
CS701
VR701
Q701
D701
RJ709
RJ708
RJ707
RJ706
RJ704
RJ705
RJ710

F MAIN P.C.B.


IC403
DIGITAL OUT (OPTICAL)
JK401
OUT
SYSTEM CONTROL
IN
JK402
JK801
L ch
LINE OUT
R ch
Q474
Q473
Q472
Q471
Q853
Q852
Q851
Q801
Q803
Q854
Q804
Q802
IC803
IC802
IC801
IC11
Q13
Q15
Q16
Q14
Q12
Q11
Q19
Q18
CN1B
CN1A
X401

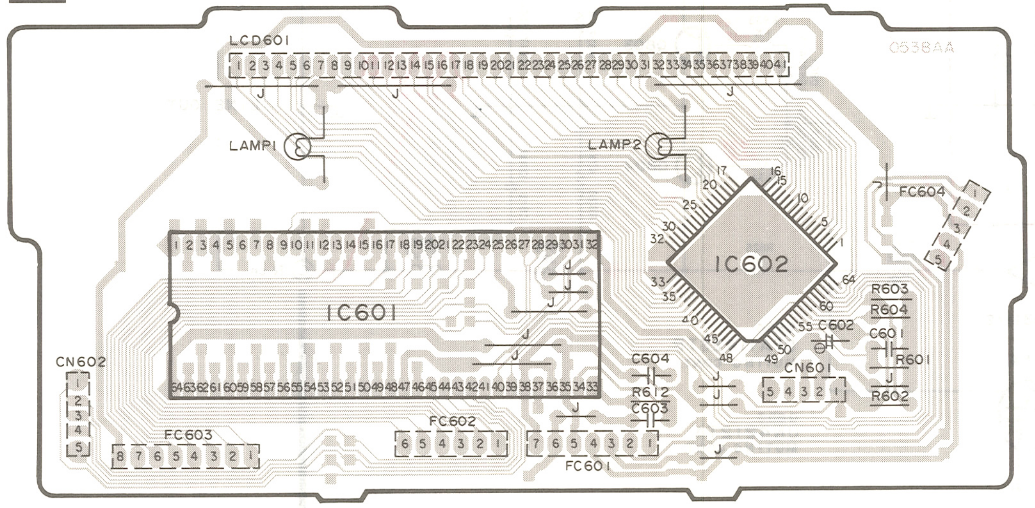
Notes:

This diagram shows a front view of the small outline type IC mounting surface.

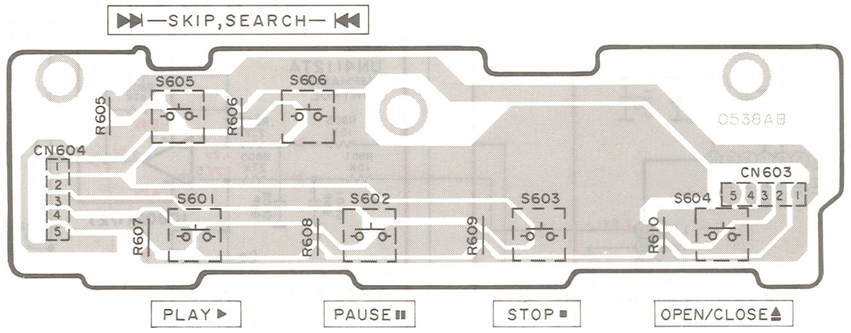
1. The circuit shown in (▬) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in (▬) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (●) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

- **This circuit board diagram may be modified at any time with the developement of new technology.**

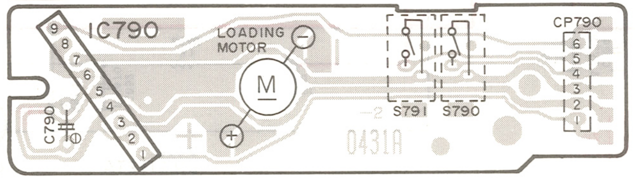
B LCD P.C.B.

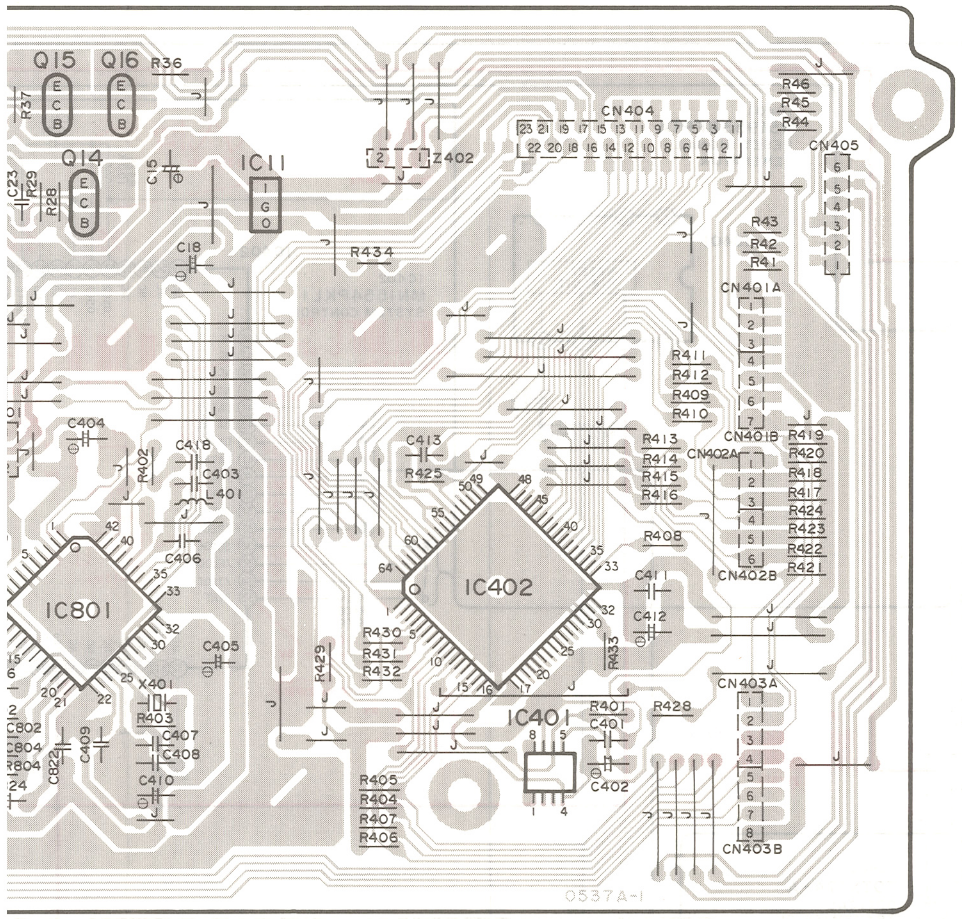

0538AA
LCD601
LAMP1
LAMP2
IC601
IC602
FC604
CN602
FC603
FC602
FC601
CN601
R603
R604
C602
C601
R601
R602
C604
R612
C603

C OPERATION P.C.B.

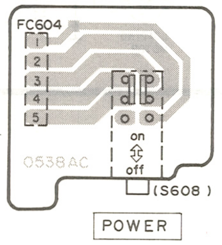

▶▶I—SKIP,SEARCH—I◀◀
S605
S606
R605
R606
CN604
S601
S602
S603
S604
CN603
R607
R608
R609
R610
0538AB
PLAY ▶
PAUSE ▮▮
STOP ■
OPEN/CLOSE ⏏

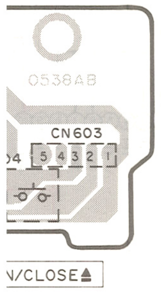
D LOADING MOTOR P.C.B.


IC790
LOADING MOTOR
M
S791
S790
CP790
C790
0431A

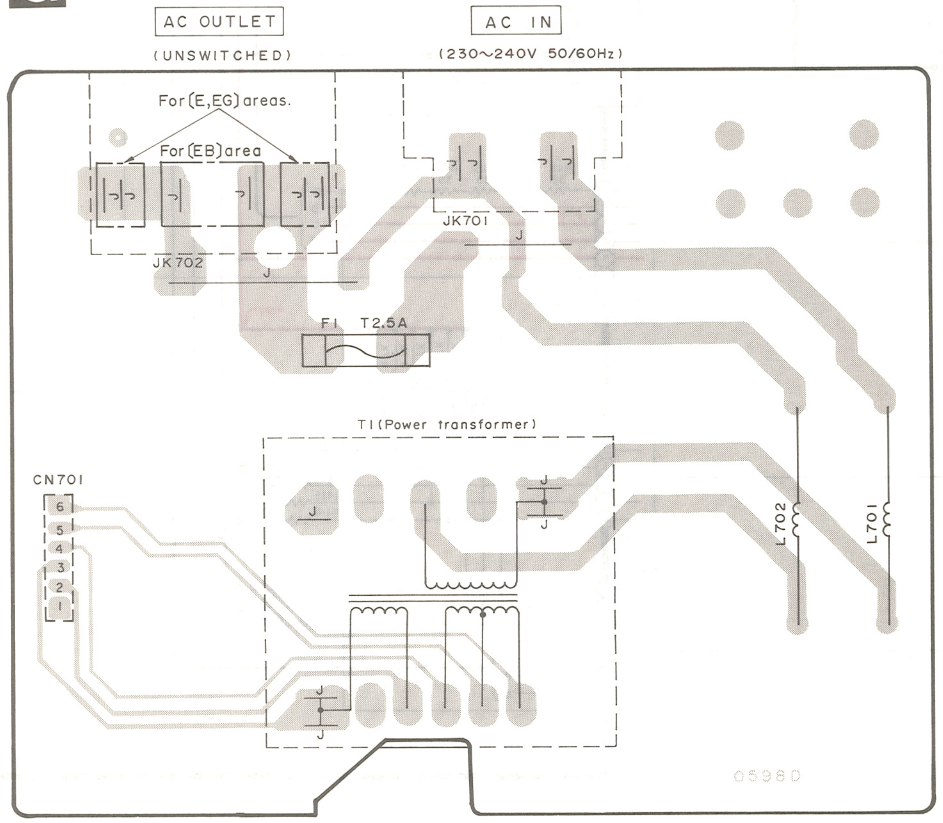

Q15
Q16
R36
R37
Q14
C23
R29
R28
C15
IC11
CN404
Z402
CN405
R46
R45
R44
R43
R42
R41
R434
C18
CN401A
R411
R412
R409
R410
CN401B
R413
R414
R415
R416
CN402A
R419
R420
R418
R417
R424
R423
R422
R421
CN402B
C404
R402
C418
C403
L401
C406
C413
R425
IC402
IC801
R408
C411
C412
C405
R433
R429
R430
R431
R432
X401
R403
C407
C408
C409
C410
IC401
R401
C401
C402
R428
CN403A
CN403B
R405
R404
R407
R406
0537A-1

E POWER SWITCH P.C.B.


FC604
0538AC
on
off
(S608)
POWER

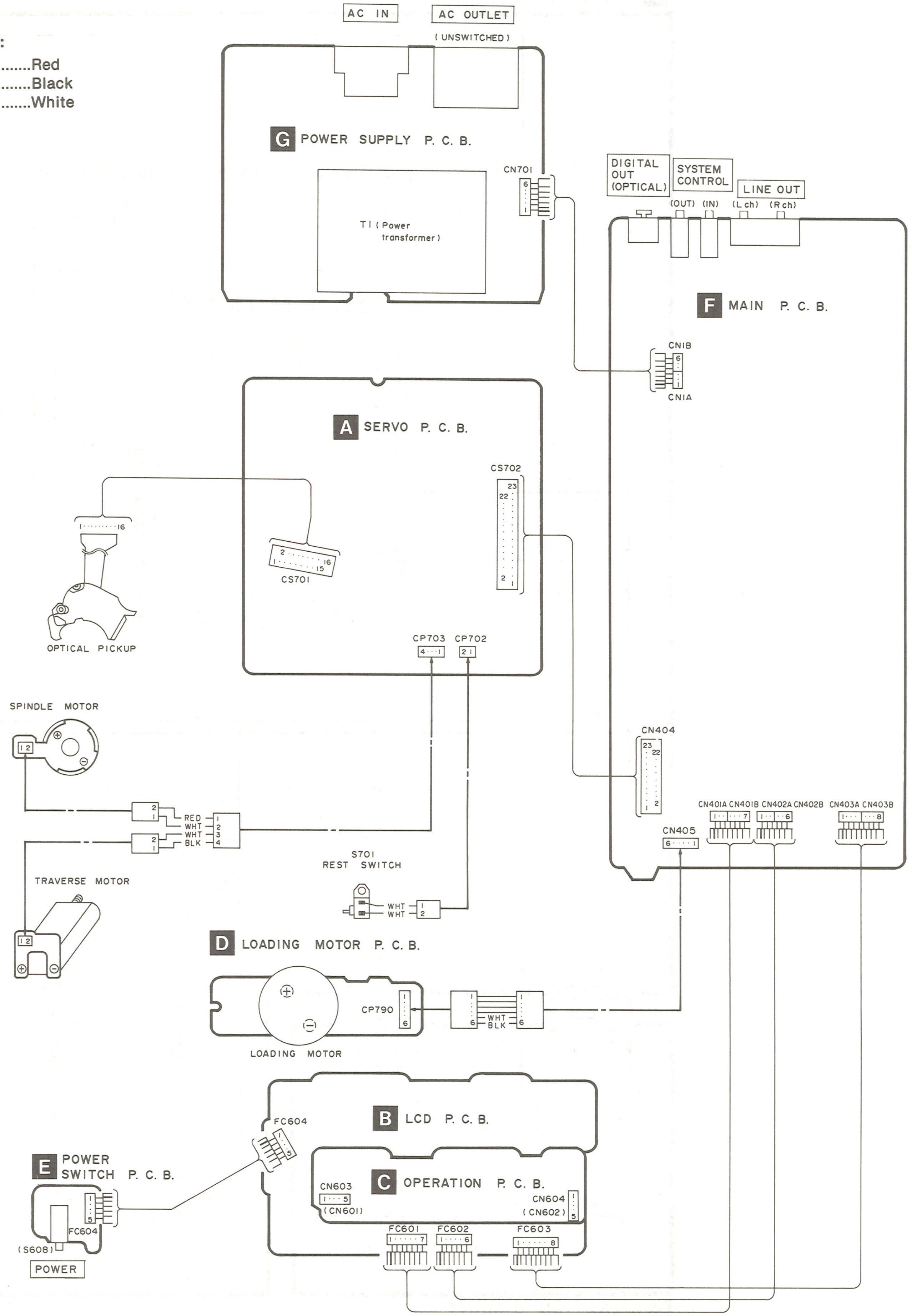

0536AB
CN603
5 4 3 2 1
N/CLOSE▲

G POWER SUPPLY P.C.B.


AC OUTLET
(UNSWITCHED)
AC IN
(230∼240V 50/60Hz)
For (E, EG) areas.
For (EB) area
JK702
JK701
F1 T2.5A
T1 (Power transformer)
CN701
L702
L701
0598D

WIRING CONNECTION DIAGRAM

Note:
RED........Red
BLK........Black
WHT.......White


AC IN
AC OUTLET
(UNSWITCHED)
G POWER SUPPLY P. C. B.
CN701
T1 (Power transformer)
DIGITAL OUT (OPTICAL)
SYSTEM CONTROL
(OUT) (IN)
LINE OUT
(L ch) (R ch)
F MAIN P. C. B.
CN1B
CN1A
A SERVO P. C. B.
CS702
CS701
OPTICAL PICKUP
CP703
CP702
SPINDLE MOTOR
TRAVERSE MOTOR
RED
WHT
WHT
BLK
S701
REST SWITCH
WHT
WHT
CN404
CN405
CN401A CN401B CN402A CN402B CN403A CN403B
D LOADING MOTOR P. C. B.
CP790
LOADING MOTOR
WHT
BLK
B LCD P. C. B.
FC604
E POWER SWITCH P. C. B.
FC604
(S608)
POWER
C OPERATION P. C. B.
CN603
(CN601)
CN604
(CN602)
FC601
FC602
FC603

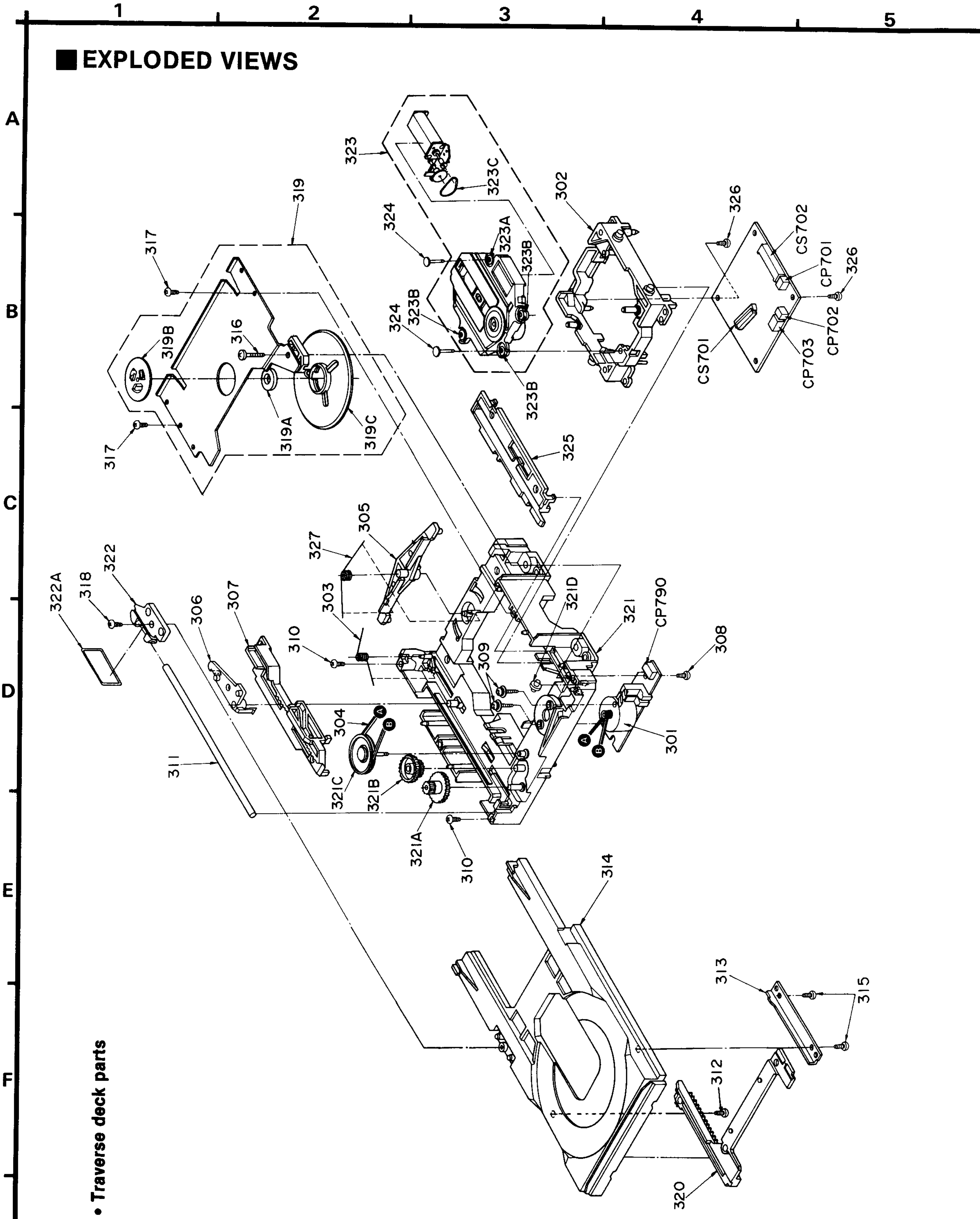
■ REPLACEMENT PARTS LIST

Notes : * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas.
* Warning: This product uses a laser diode. Refer to caution statements on page 3.

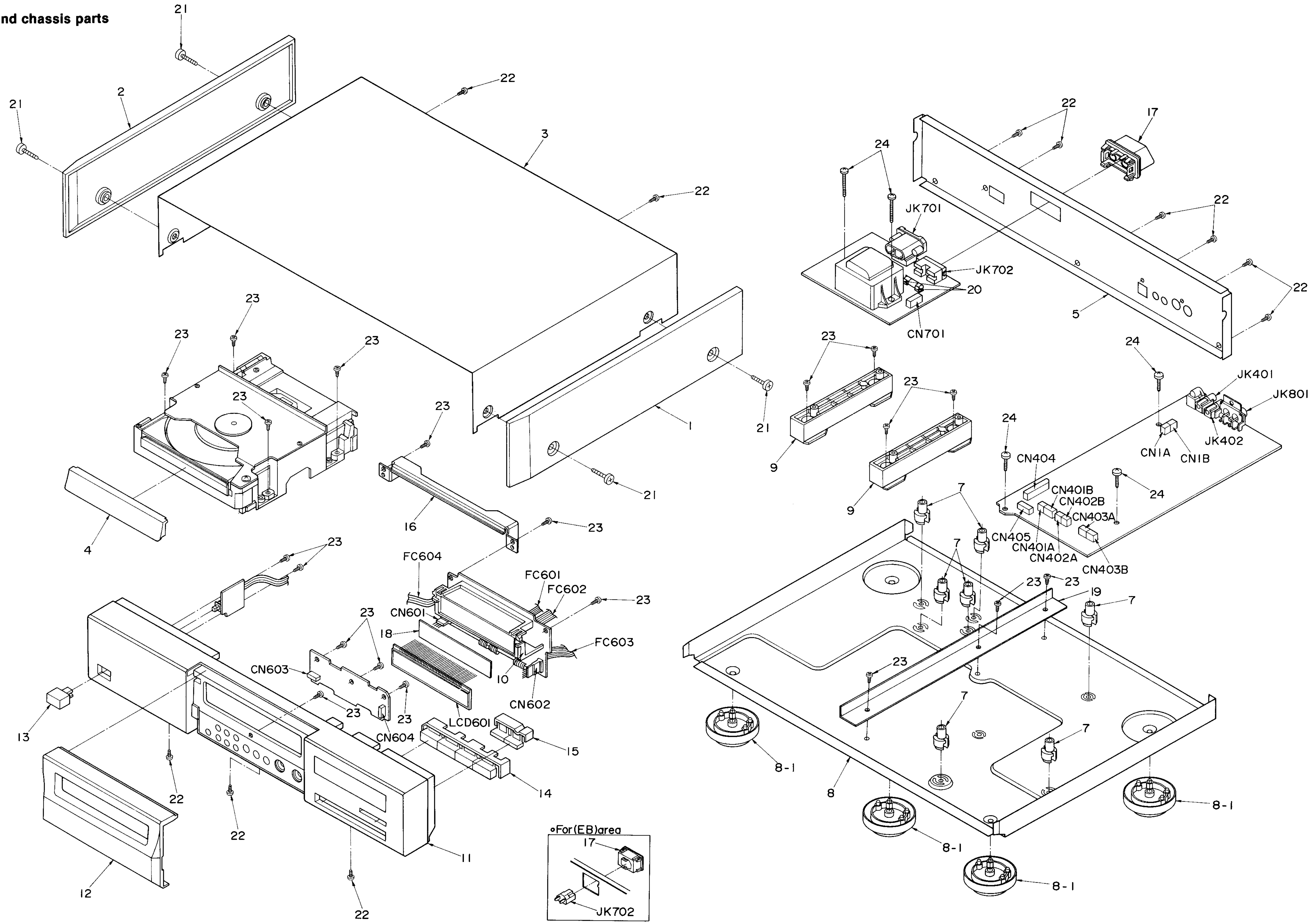
Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RGK0330-S	SIDE PANEL(R)	
2	RGK0331-S	SIDE PANEL(L)	
3	RKM0154B-S	CABINET	
4	RGK0346-S	TRAY ORNAMENT	
5	RGR0111F-A	REAR PANEL	(EG)
5	RGR0111F-B	REAR PANEL	(E)
5	RGR0111E-A	REAR PANEL	(EB)
7	RKQ0089	P. C. B. SUPPORT	
8	RFKJLE10-S	BOTTOM BOARD ASS'Y	
8-1	RKA0045	FOOT	
9	RMR0376	SPACER	
10	RMN0125	LCD HOLDER	
11	RFKGLE10E-S	FRONT PANEL ASS'Y	
12	RGK0348-S	CENTER ORNAMENT	
13	RGU0030-1S	BUTTON, POWER	
14	RGU0512B-S	BUTTON, OPERATION A	
15	RGU0513-S	BUTTON, OPERATION B	
16	RMA0393	ANGLE	
17	RJS1A4802-A	AC OUTLET COVER	(EB)
17	RJS1A4902-A	AC OUTLET COVER	(E, EG)
18	RGH0062	SHEET	
19	RMA0482	ANGLE	
20	EYF52BC	FUSE HOLDER	
21	RHD30016	SCREW	
22	XTBS3+8JFZ1	SCREW	
23	XTB3+8JFZ	SCREW	
24	XTB3+20JFZ	SCREW	
		TRAVERSE DECK	
301	REM0019	LOADING MOTOR ASS'Y	
302	RMK0105	CHASSIS	
303	RME0063	SPRING, LOCK LEVER	
304	RMG0158	BELT, RUBBER	
305	RML0177	LEVER, CONVERSION	
306	RML0178	LEVER, LOCK	
307	RMM0058	SLIDE PLATE(1)	
308	XTN26+6G	SCREW	
309	XYN2+F6FZ	SCREW	
310	RHD20010	SCREW	
311	RMU0046	TRAY GUIDE SHAFT	
312	RHD20009-1	SCREW	
313	RMA0328	SHUTTER HOLDER	
314	RGQ0066-H	TRAY(B)	
315	XTN2+8G	SCREW	
316	XTB3+25GFZ	SCREW	
317	XTN26+6G	SCREW	
318	XTN3+8JFZ	SCREW	
319	RXQ0122	CLAMPING PLATE ASS'Y	
319A	RHM245ZA	MAGNET	
319B	RMR0334	FIXED PLATE	
319C	RXQ0123	MAGNET HOLDER ASS'Y	
320	RFKNLDN7N-K	DRIVE GEAR(2)ASS'Y	
321	RFKJXDT77-H	MECHANICAL CHASSIS ASS'Y	
321A	RDG0142	RELAY GEAR	
321B	RDG0143	DRIVE GEAR(1)	
321C	RDP0041	RELAY PULLEY	
321D	SDRD14	ROLLER(B)	
322	RFKNXDT77C-H	GUIDE HOLDER ASS'Y	
322A	RMG0159	CUSHION RUBBER	
323	SODD110Z	TRAVERSE DECK UNIT	
323A	SHGD112	FLOATING RUBBER(A)	
323B	SHGD113-1	FLOATING RUBBER(B)	
323C	RDV0014	BELT, RUBBER	
324	RMS0123-1	FIXED PIN	
325	RMM0059	SLIDE PLATE(2)	
326	XTV26+6G	SCREW	
327	RME0087	SPRING, ASSISTANCE	
		PACKING MATERIAL	
P1	RPG0932	PACKING CASE	
P2	RPN0436	PAD	
P3	SPSD152	ACCESSORIES BOX	
P4	SPP753	PROTECTION BAG	
P5	RPN0540	TRANSPORTATION PLATE	
		ACCESSORIES	
A1	RFKSLE10E-S	INSTRUCTION MANUAL ASS'Y	(E)
A1	RQT1088-G	INSTRUCTION MANUAL	(EB)
A1	RQT1091-D	INSTRUCTION MANUAL	(EG)
A2	RQA0013	WARRANTY CARD	
A3	RQCB0169	SERVICENTER LIST	
A4	SFDAC05E03	AC POWER SUPPLY CORD	(E, EG) ⚠
A4	SJA188	AC POWER SUPPLY CORD	(EB) ⚠
A5	SJP2129-5	STEREO CONNECTION CABLE	
A6	SJP2257T	L-TYPE CABLE	

■ EXPLODED VIEWS

- **Traverse deck parts**


1
2
3
4
5
A
B
C
D
E
F
323
323C
302
319
324
323A
323B
326
CS702
CS701
CP701
326
317
316
319B
324
323B
CP702
CP703
CS701
323B
319A
319C
317
325
305
327
322
322A
318
303
306
307
310
321D
321
CP790
309
308
304
Ⓐ
Ⓑ
301
311
321C
321B
321A
310
314
313
315
312
320

• **Cabinet and chassis parts**


21
2
21
22
3
22
1
21
21
23
23
23
23
23
4
16
23
23
FC604
FC601
FC602
CN601
18
23
FC603
10
CN602
CN603
23
23
LCD601
CN604
13
15
14
22
22
11
12
22
∘For (EB) area
17
JK702
22
17
24
JK701
JK702
20
CN701
22
22
5
23
23
9
9
24
JK401
JK801
JK402
CN1A
CN1B
24
CN404
24
CN401B
CN402B
CN403A
CN405
CN401A
CN402A
CN403B
7
7
23
23
19
7
23
7
7
8-1
8
8-1
8-1
8-1

■ REPLACEMENT PARTS LIST

Notes : • Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
• The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
∗ Warning: This product uses a laser diode. Refer to caution statements on page 3.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	LM2940T5	REGULATOR	
IC401	M51953BFPTA	RESET SIGNAL GENERATOR	
IC402	MN1554PKL1	SYSTEM CONTROL	
IC403	TOTX174-A	OPTICAL T. M. MODULE	
IC601	MB88724BPKQ1	MICROCOMPUTER(OPERATION)	
IC602	LC7582A	LCD DRIVE	
IC790	TA7291S	MOTOR DRIVE	
IC801	MN6474	DIGITAL FILTER & D/A CONV.	
IC802	LM833M63	COMPARATOR	
IC803	SVIBA4558F	L. P. FILTER AMP.	
		TRANSISTOR(S)	
Q11	2SC3311A-Q	TRANSISTOR	
Q12-16	2SD2037EFTA	TRANSISTOR	
Q18, 19	2SA1309A-R	TRANSISTOR	
Q471, 472	DTC144ESTP	TRANSISTOR	
Q473, 474	2SC3311ARSTA	TRANSISTOR	
Q801, 802	2SC3311A-Q	TRANSISTOR	
Q803, 804	2SD1450RTA	TRANSISTOR	
Q851, 852	UN4112	TRANSISTOR	
Q853	UN4212TA	TRANSISTOR	
Q854	DTA114ESTP	TRANSISTOR	
		DIODE(S)	
D11-14	SVD1SR35200A	DIODE	⚠
D15	MA4068M	DIODE	
D16	MA4120	DIODE	
D17	MA4082MTA	DIODE	
D22	MA4068M	DIODE	
D23-26	SVD1SR35200A	DIODE	⚠
D471, 472	MA700TA	DIODE	
D801, 802	1SS254TA	DIODE	
D852-854	1SS254TA	DIODE	
		COIL(S)	
L401	RLQZP2R2KT-Y	COIL	
L471-473	RLQZP3R3KT-Y	COIL	
L701, 702	SLQX400-D	COIL	⚠
L801, 802	RLQZP3R3KT-Y	COIL	
		TRANSFORMER(S)	
T1	RTP1K4B011-V	POWER TRANSFORMER	⚠
		COMPONENT COMBINATION(S)	
Z401, 402	EXCELDR35V	COMBINATION PART	
		LCD(S)	
LCD601	EDD113CB5A2P	LCD	
		OSCILLATOR(S)	
X401	SVQ49U338S	OSCILLATOR(33. 8688MHz)	
		LAMP(S)	
LAMP1, 2	XAMR126S7A	LAMP	
		FUSE(S)	
F1	XBA2C25TB0	FUSE 250V T2. 5A	⚠
		SWITCH(ES)	
S601	EVQ21405R	PLAY	
S602	EVQ21405R	PAUSE	
S603	EVQ21405R	STOP	
S604	EVQ21405R	OPEN/CLOSE	
S605	EVQ21405R	SKIP-SERCH(F)	
S606	EVQ21405R	SKIP-SERCH(R)	
S608	RSP2B010	POWER	
S790, 791	RSH1A005	CLOSE/OPEN DET.	
		CONNECTOR(S) AND SOCKET(S)	
CN1A	RJS1A1703	CONNECTOR(3P)	
CN1B	RJS1A1703	CONNECTOR(3P)	
CN401A	RJS1A1703	CONNECTOR(3P)	
CN401B	RJS1A1704	CONNECTOR(4P)	
CN402A	RJS1A1703	CONNECTOR(3P)	
CN402B	RJS1A1703	CONNECTOR(3P)	
CN403A	RJS1A1704	CONNECTOR(4P)	
CN403B	RJS1A1704	CONNECTOR(4P)	
CN404	RJS1A6823	CONNECTOR(23P)	
CN405	EMCS0660MT6	CONNECTOR(6P)	
CN601, 602	SJT30548BB1	CONNECTOR(5P)	
CN603, 604	SJS50581BB	SOCKET(5P)	
CN701	SJT30643-V	CONNECTOR(6P)	
CP790	RJP6G17ZA	CONNECTOR(6P)	
		JACK(S)	
JK401	RJJ33T01	SYSTEM CONTROL(OUTPUT)	
JK402	RJJ33T01	SYSTEM CONTROL(INPUT)	
JK701	SJS9236	AC INLET	⚠
JK702	RJS1A4802B	AC OUTLET	(EB) ⚠
JK702	RJS1A4902B	AC OUTLET	(E, EG) ⚠
JK801	RJH3201N	OUTPUT TERMINAL	
		FLAT CABLE(S)	
FC601	REZ0329	FLAT CABLE(7P)	
FC602	REZ0323	FLAT CABLE(6P)	
FC603	REZ0337	FLAT CABLE(8P)	
FC604	REZ0324	FLAT CABLE(5P)	
		<SERVO P. C. B.>	
		INTEGRATED CIRCUIT(S)	
IC701	AN8800SCE2	SERVO AMP	
IC702	TCA0372DM2R	SPINDLE MOTOR DRIVE	
IC703	AN8377N	TRAVERSE MOTOR DRIVE	
IC704	MN6650	DIGITAL SERVO PROCESSOR	
IC706	MN6626	DIGITAL SIGNAL PROCESSOR	
		TRANSISTOR(S)	
Q701	2SB709STW	TRANSISTOR	
		DIODE(S)	
D701	MA110TW	DIODE	
		VARIABLE RESISTOR(S)	
VR701	EVNDXAA00B14	V. R, BEST EYE ADJ.	
		SWITCH(ES)	
S701	SSHD5	REST DETECTOR	
		PLUG(S) & SOCKET(S)	
CP701	RJP2G17ZA	PLUG(2P)	
CP702	RJP2G17ZA	PLUG(2P)	
CP703	RJP4G17ZA	PLUG(4P)	
CS701	RJU035T016-1	SOCKET(16P)	
CS702	RJS1A6723-1Q	SOCKET(23P)	

RESISTORS & CAPACITORS

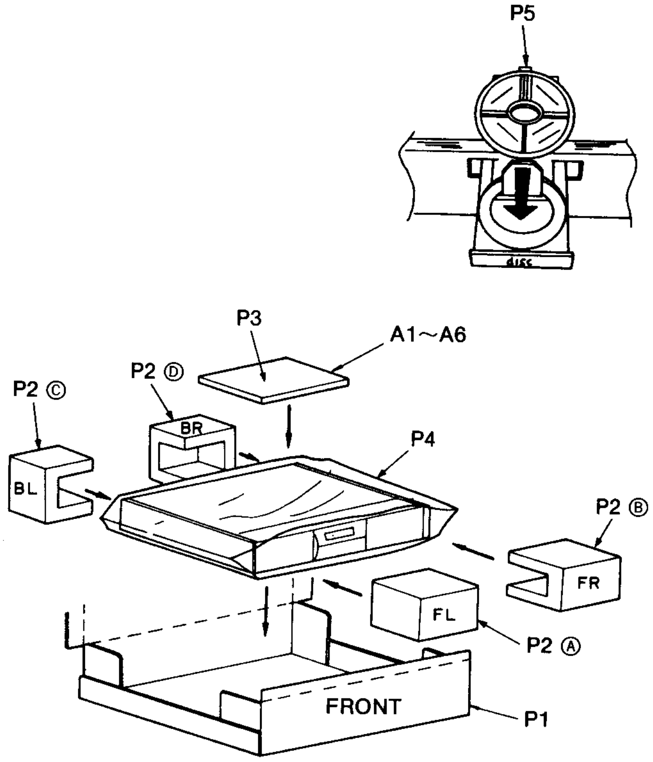
Notes : * Capacity valuse are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R13-16	ERDS2TJ102	1/4W 1K
R17, 18	ERDS2TJ391	1/4W 390
R19	ERQ16NKWR15E	1/6W 0.15
R20, 21	ERQ16NKWR68E	1/6W 0.68
R23	ERDS2TJ151	1/4W 150
R24	ERDS2EJ121	1/4W 120
R25	ERDS2TJ102	1/4W 1K
R26, 27	ERDS2TJ472	1/4W 4.7K
R28-31	ERDS2TJ1R0	1/4W 1.0
R32, 33	ERDS2TJ152	1/4W 1.5K
R34	ERDS2EJ121	1/4W 120
R35	ERDS2TJ101	1/4W 100
R36-38	ERDS2TJ1R0	1/4W 1.0
R41-46	ERDS2TJ390	1/4W 39
R401	ERDS2TJ472	1/4W 4.7K
R402	ERDS2TJ122	1/4W 1.2K
R403-408	ERDS2TJ472	1/4W 4.7K
R409-416	ERDS2TJ221	1/4W 220
R417-424	ERDS2TJ472	1/4W 4.7K
R425	ERDS2TJ104	1/4W 100K
R427	ERDS2TJ822	1/4W 8.2K
R428	ERDS2TJ102	1/4W 1K
R429, 430	ERDS2TJ472	1/4W 4.7K
R431	ERDS2TJ102	1/4W 1K
R432	ERDS2TJ472	1/4W 4.7K
R433	ERDS2TJ103	1/4W 10K
R434	ERDS2TJ470	1/4W 47
R471-474	ERDS2TJ100	1/4W 10
R475-480	ERDS2TJ393	1/4W 39K
R481, 482	ERDS2TJ223	1/4W 22K
R483	ERDS2TJ100	1/4W 10
R601	ERDS2TJ473	1/4W 47K
R602	ERDS2TJ331	1/4W 330
R603-610	ERDS2TJ472	1/4W 4.7K
R612	ERDS2TJ104	1/4W 100K
R801-804	ERDS2TJ153	1/4W 15K
R805-808	ERDS2TJ273	1/4W 27K
R809-812	ERDS2TJ473	1/4W 47K
R813, 814	ERDS2TJ102	1/4W 1K
R815, 816	ERDS2TJ104	1/4W 100K
R817, 818	ERDS2TJ391	1/4W 390
R819, 820	ERDS2TJ103	1/4W 10K
R821, 822	ERDS2TJ123	1/4W 12K
R823, 824	ERDS2TJ562	1/4W 5.6K
R825, 826	ERDS2TJ102	1/4W 1K
R827, 828	ERDS2TJ473	1/4W 47K
R829, 830	ERDS2TJ390	1/4W 39
R831-834	ERDS2TJ102	1/4W 1K
R837, 838	ERDS2TJ102	1/4W 1K
R851	ERDS2TJ272T	1/4W 2.7K
R852	ERDS2TJ102	1/4W 1K
R853	ERDS2TJ471	1/4W 470
R854	ERDS2TJ472	1/4W 4.7K
R855	ERDS2TJ102	1/4W 1K
R856	ERDS2TJ272T	1/4W 2.7K
		CAPACITORS
C11, 12	ECKR1H103ZF5	50V 0.01U
C13	ECEA1EU222B	25V 2200U
C15	ECEA1CK100B	16V 10U
C16	ECEA1EU222B	25V 2200U
C18	ECEA0JK470	6.3V 47U
C19	ECEA1CK330	16V 33U
C20	ECEA1CK470	16V 47U
C21-23	ECBT1E103ZF	25V 0.01U
C24	ECKR1H103ZF5	50V 0.01U
C27	ECEA1EU221	25V 220U
C28	ECBT1E103ZF	25V 0.01U
C401	ECBT1E103ZF	25V 0.01U
C402	ECEA1HU0R1	50V 0.1U
C403	ECBT1H6R8K5	50V 6.8P
C404	ECEA0JU331B	6.3V 330U
C405	ECEA0JK101	6.3V 100U
C406	ECFR1E104ZF5	25V 0.1U
C407, 408	ECBT1H5R6K5	50V 5.6P
C409	ECFR1E104ZF5	25V 0.1U
C410	ECEA0JK101	6.3V 100U
C411	ECFR1E104ZF5	25V 0.1U
C412	ECEA0JK470	6.3V 47U
C413	ECBT1E103ZF	25V 0.01U
C416	ECFR1E104ZF5	25V 0.1U
C417	ECEA0JK101	6.3V 100U
C418	ECCR1H390JC5	50V 39P
C471, 472	ECFR1E104ZF5	25V 0.1U
C601	ECBA1H681KB5	50V 680P
C602	ECEA0JK470	6.3V 47U
C603, 604	ECBT1E103ZF	25V 0.01U
C790	ECA1AKF820E	10V 82U
C801-804	ECBT1H680J5	50V 68P
C805-808	ECBT1H470J5	50V 47P
C809, 810	ECQB1H333KF3	50V 0.033U
C811, 812	ECQB1H102KF3	50V 1000P
C813, 814	ECBT1H101KB5	50V 100P
C815, 816	ECEA1AN220S	10V 22U
C817, 818	ECBT1H102KB5	50V 1000P
C819, 820	ECBT1H471KB5	50V 470P
C821, 822	ECFR1E104ZF5	25V 0.1U
C823, 824	ECEA0JU331B	6.3V 330U
C825, 826	ECFR1E104ZF5	25V 0.1U
C827, 828	ECEA1CK100B	16V 10U
C851	ECEA1CK100B	16V 10U
C852	ECEA1CU471B	16V 470U
		<SERVO P.C.B.>
		RESISTOR(S)
R701	ERJ6GEYJ100V	1/10W 10
R702	ERJ6GEYJ471V	1/10W 470
R703	ERJ6GEYJ102V	1/10W 1K
R704	ERJ6GEYJ103V	1/10W 10K
R706	ERJ6GEYJ473V	1/10W 47K
R707	ERJ6GEYJ222V	1/10W 2.2K
R708	ERJ6GEYJ683V	1/10W 68K
R709	ERJ6GEYJ122V	1/10W 1.2K
R710	ERJ6GEYJ182V	1/10W 1.8K
R711	ERJ6GEYJ473V	1/10W 47K
R712	ERJ6GEYJ471V	1/10W 470
R714	ERJ6GEYJ473V	1/10W 47K
R715	ERJ6GEYJ223V	1/10W 22K
R716	ERJ6GEYJ104V	1/10W 100K
R717	ERJ6GEYJ682V	1/10W 6.8K
R718	ERJ6GEYJ223V	1/10W 22K
R719	ERJ6GEYJ123V	1/10W 12K
R720	ERJ6GEYJ273V	1/10W 27K
R721	ERJ6GEYJ823V	1/10W 82K
R722	ERJ6GEYJ102V	1/10W 1K
R723	ERJ6GEYJ104V	1/10W 100K
R724	ERJ6GEYJ104V	1/10W 100K
R725	ERJ6GEYJ471V	1/10W 470
R732	ERJ6GEYJ562V	1/10W 5.6K
R733	ERJ6GEYJ332V	1/10W 3.3K
R734	ERJ6GEYJ562V	1/10W 5.6K
R735	ERJ6GEYJ222V	1/10W 2.2K
R736	ERJ6GEYJ682V	1/10W 6.8K
R737	ERJ6GEYJ562V	1/10W 5.6K
R738	ERJ6GEYJ562V	1/10W 5.6K
R739	ERJ6GEYJ562V	1/10W 5.6K
R741	ERJ6GEYJ102V	1/10W 1K
R742	ERJ6GEYJ102V	1/10W 1K
R743	ERJ6GEYJ102V	1/10W 1K
R744	ERJ6GEYJ393V	1/10W 39K
R747	ERJ6GEYJ473V	1/10W 47K

Ref. No.	Part No.	Values & Remarks
R760	ERJ6GEYJ561V	1/10W 560
R761	ERJ6GEYJ561V	1/10W 560
R762	ERJ6GEYJ561V	1/10W 560
		JUMPER(S)
RJ702	ERJ6GEY0R00V	CHIP JUMPER
RJ704	ERJ6GEY0R00V	CHIP JUMPER
RJ705	ERJ6GEY0R00V	CHIP JUMPER
RJ706	ERJ6GEY0R00V	CHIP JUMPER
RJ707	ERJ6GEY0R00V	CHIP JUMPER
RJ708	ERJ6GEY0R00V	CHIP JUMPER
RJ709	ERJ6GEY0R00V	CHIP JUMPER
RJ710	ERJ6GEY0R00V	CHIP JUMPER
		CAPACITOR(S)
C701	ECEA0JKS220I	6.3V 22U
C702	ECEA0JKS470I	6.3V 47U
C703	ECEA0JKS101I	6.3V 100U
C709	ECUV1C224KBM	16V 0.22U
C710	ECUV1C104MBM	16V 0.1U
C711	ECUV1E103MBN	25V 0.01U
C713	ECEA1CSN4R7I	16V 4.7U
C714	ECEA1HKS010I	50V 1U
C715	ECUV1H472KBN	50V 4700P
C716	ECUV1C473KBN	16V 0.047U
C717	ECUV1H681KBN	50V 680P
C718	ECEA1AKS101I	10V 100U
C719	ECUV1E103MBN	25V 0.01U
C720	ECUV1E153MBN	25V 0.015U
C721	ECUV1E103MBN	25V 0.01U
C722	ECEA0JKS470I	6.3V 47U
C723	ECUV1C104MBM	16V 0.1U
C724	ECUV1E333MBN	25V 0.033U
C725	ECUV1E103MBN	25V 0.01U
C726	ECUV1H471KBN	50V 470P
C727	ECEA0JKS470I	6.3V 47U
C728	ECUV1C104MBM	16V 0.1U
C729	ECUV1C473MBN	16V 0.047U
C730	ECUV1C224KBM	16V 0.22U
C731	ECEA0JKS331I	6.3V 330U
C732	ECUV1H102MBN	50V 1000P
C733	ECEA0JKS101I	6.3V 100U
C734	ECUV1E223MBN	25V 0.022U
C735	ECUV1C224KBM	16V 0.22U
C737	ECUV1C224KBM	16V 0.22U
C738	ECEA0JKS101I	6.3V 100U
C739	ECUV1E103MBN	25V 0.01U
C740	ECUV1H472MBN	50V 4700P
C741	ECUV1C224KBM	16V 0.22U
C748	ECEA1HKS010I	50V 1U

Ref. No.	Part No.	Values & Remarks
C749	ECUV1E103MBN	25V 0.01U
C750	ECUV1H050DCN	50V 5P
C751	ECUV1C224KBM	16V 0.22U
C752	ECUV1C104MBM	16V 0.1U
C755	ECUV1C104MBM	16V 0.1U
C758	ECUV1C224KBM	16V 0.22U

■PACKING



(P2 Ⓐ Ⓑ Ⓒ Ⓓ: part No. RPN0436)

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